Vol. 923 Number 1

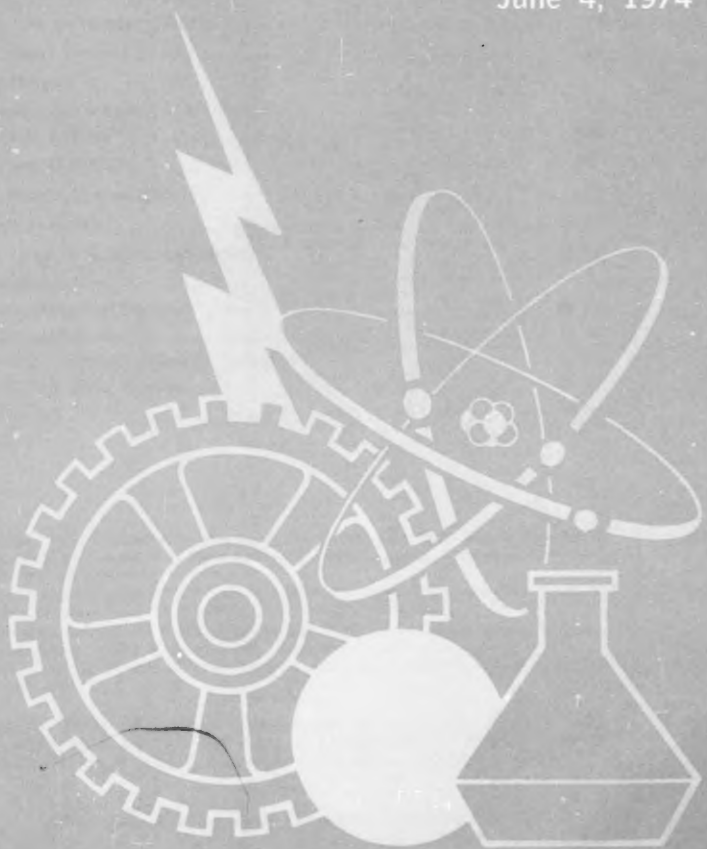
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

June 4, 1974



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 4, 1974 Volume 923 Number 1

CONTENTS

	Page
Patent and Trademark Notices	
Board of Appeals Decisions Rendered in the Month of April 1974	2
Relocation of Board of Patent Interferences in Building 6, Crystal Plaza	2
Examination	2
Trial Voluntary Protest Program	2
Patent Suits	3
Patent Notices	
Certificates of Correction for the Week of June 4, 1974	5
National Technical Information Service	5
Condition of Patent Applications	7
Reissue Patents Granted (28,027)	8
Plant Patents Granted (3,561)	11
Patents Granted	
General and Mechanical (3,813,694)	12
Chemical (3,814,577)	241
Electrical (3,814,827)	289
Design Patents Granted (231,716)	375
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 42
Classification of	
Patents (Including Reissues)	PI 45
Designs and Plants	PI 48
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 49
Designs and Plants	PI 51

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $211.00 per annum, foreign mailing $52.75 additional; single copies $4.10 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $60.25 per annum, foreign mailing $15.10 additional; single copies $1.25 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of April 1974

Examiner affirmed	169
Examiner affirmed in part	28
Examiner reversed	43
Total	240

Relocation of Board of Patent Interferences in Building 6, Crystal Plaza

Effective today, the Board of Patent Interferences will be located on the 11th floor of Building 6, Crystal Plaza, Virginia, in Room No. 1116.

Telephone numbers of the members and personnel attached to the Board, as shown in the current directory, remain unchanged and may continue to be used.

All final hearings will, until further notice, continue to be held in the hearing room in Building 2.

WILLIAM I. MERKIN,
Assistant Commissioner for Administration.

May 13, 1974.

Examination

Pursuant to the provisions of Rule 341(c), an examination for persons seeking registration before the United States Patent Office as patent attorneys or agents will be held on Tuesday, September 10, 1974.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the examination must be filed in the Patent Office together with a $35 fee not later than July 31, 1974.

Application blanks may be obtained from the Clerk of the Patent Office Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va., or by mail addressed to the Commissioner of Patents, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

May 13, 1974.

Trial Voluntary Protest Program

After reviewing the comments received as a result of the Notice of Proposed Rule Making entitled, "Protests to the Grant of a Patent," dated May 15, 1973, published at 911 O.G. 760, the Patent Office has decided to institute a Trial Voluntary Protest Program limited to 2,000 applications.

The underlying purpose of protest proceedings is to assist the Patent Office by bringing the best prior art and information relevant to the patentability of a patent application to the examiner's attention. Occasionally patents are held invalid by the courts because of prior art or other information which was not available or known to the examiner. Protest proceedings are intended to elicit from the public such prior art or other information not cited by the examiner which bears upon the question of patentability.

Several benefits are expected to accrue from protest proceedings. First, patents would have a more meaningful presumption of validity because of appropriate consideration by the examiner of additional evidence submitted by the public. Second, potential competitors of the applicant would benefit from having the opportunity to call to the attention of the Patent Office information that could either prevent a patent from issuing or lead to claims of more restricted scope. Further, the protest proceedings may be helpful in minimizing the more expensive conventional procedure of litigating the question of validity at a later date. Finally, the public would benefit from the resultant strengthening of the presumption of validity of patents granted on applications which underwent protest proceedings and the strengthening of the patent system for its intended purposes.

Since legislation is pending in Congress which would make opposition or protest proceedings mandatory in all allowed applications, it appears appropriate and desirable to gain some experience at this time with a Trial Voluntary Protest Program. The Patent Office would welcome any comments, from those who elect to participate in the program, relative to their experience concerning the effectiveness, costs, etc.

Since the trial program is voluntary and limited to a selected number of applications, no rule changes are contemplated or considered necessary at this time.

Applications Involved

The 2,000 applications involved in the Trial Voluntary Protest Program will include 135 applications allowed in each of the 14 examining groups excluding Group 220, and 110 applications allowed in Group 220, after July 1, 1974. No other applications will be made part of the trial program. The applications in the trial will be limited to the 1970 filing date series and will exclude all reissue, plant, and design applications. Also, applications which have been invoved in proceedings before the Board of Appeals, the Board of Patent Interferences, or the courts will be excluded from the trial program.

Waiver of Confidentiality

A form letter will be sent to the applicant of each of the 2,000 applications involved in the trial. The letter will indicate that the application is one of the selected applications and will afford to applicant the opportunity to participate in the program by filing a voluntary waiver of confidentiality thereby making his application available for protest.

Response to Request for Waiver of Confidentiality

The applicant will have two months after the mailing of the form letter concerning waiver of confidentiality to either (1) file the waiver of his right to keep the application confidential, signed by the applicant, assignee of record, or attorney or agent of record, or (2) indicate that he does not desire to participate in the trial program. A response from the applicant to the form letter will be requested. Such response is considered desirable to allow prompt processing of all 2,000 applications selected for the Trial Voluntary Protest Program. No extension of the two month period will be granted.

If the applicant declines to participate in the program, his application will be forwarded to the Patent Issue Division for mailing of the Notice of Allowance. In these situations no record of the correspondence will be made in the application file. Also, the Patent Office will not keep any records concerning the identity of the particular applications where the opportunity to participate in the program was declined.

If a proper waiver of the right to confidentiality is submitted within two months of the date of the form letter regarding voluntary waiver, the application will be placed in the Trial Voluntary Protest Program.

Following an affirmative response a notice, identifying the application, will be published in the Official Gazette similar to that used for patents. The notice will include necessary identifying information, including the examining group to which the application is assigned, an illustrative figure, a representative claim or claims, and a listing of references cited by the Patent Office.

On the date the notice is published in the Official Gazette, the application file will also be made available for public

inspection for the duration of the protest period in the examining group and the application will be available in printed form similar to a patent. The printed application will include all the figures and the specification, including claims. All printed applications will be classified and placed in the Patent Office search files. Copies of the printed applications will be available to the public at the prices set by statute for patent copies.

PERIOD FOR FILING PROTEST

Protesters will have a period of three months running from date of publication of the noice in the OFFICIAL GAZETTE in which to file their protest in the Patent Office. Each protest must be filed in duplicate, and include the grounds which the protester believes have a bearing on the patentability of any claim contained in the published application. If the grounds are based on prior art, the protest should include a copy of the prior art together with an explanation of the relevance of such prior art to the allowed claims. In addition or alternatively, the protester will have the opportunity to comment on the manner in which the prior art of record was applied and raise any other matter which may affect the patentability of the claimed invention. In cases where prima facie evidence is presented as to prior public use or sale of the invention, the public use proceedings set forth in Rule 292 will be used to provide the protester presenting such evidence with an opportunity to be heard. No extension of the three month period will be granted.

PROTESTER INVOLVEMENT

A protester may elect to either (1) have his identity kept secret and have no further participation in the proceedings or (2) be recognized in the application file and become involved in any future prosecution of the application.

In both instances the protester must initially identify himself and give his address; however, if he elects to forego future involvement, he may identify himself on a cover letter and request that the cover letter not be made of record. In such instances the cover letter will be destroyed upon completion of prosecution when the application is forwarded to either Patent Issue Division or the abandoned files.

CONSIDERATION OF PROTEST

The published allowed application files will be retained ruring the protest period in the examining groups. The examining groups will receive all protests filed, acknowledge receipt thereof, and make them of record in the application files. At the end of the period for filing protests, three months after publication in the OFFICIAL GAZETTE, those applications in which no protests have been filed will be forwarded to the Patent Issue Division for mailing of the Notice of Allowance, while those applications in which protests have been filed will be referred to the group director for decision as to whether prosecution should be reopened.

If the group director decides that the evidence submitted does not constitute a prima facie showing of non-patentability of any allowed claim, the application will be forwarded to the Patent Issue Division for mailing of the Notice of Allowance. The protesters who elected to participate in subsequent prosecution will be notified that the prosecution has not been reopened, and the applicant will be sent the duplicate copy of all protests. The group director's decision will be final and not subject to petition by any protester.

If the group director decides that the submitted evidence constitutes a prima facie showing of non-patentability of any allowed claim, prosecution of the application will be reopened and the application will be re-examined. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim believed unpatentable. The duplicate copy of all protests will be mailed to the applicant with the Office action. Protesters who elected to participate in later prosecution and submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters who elected to participate in later prosecution will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

RESPONSE TO SUBSEQUENT OFFICE ACTIONS BY THE APPLICANT

As a result of re-exmination of the application, the applicant will be permitted to respond, such as by presenting amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters, who submitted evidence on which a rejection in the Office action is based and who elected to participate in later prosecution, to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response, including appeal brief, filed. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

COMMENT ON APPLICANT'S RESPONSE BY THE PROTESTER

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

CONCLUSION OF PROSECUTION

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified thereof and the application will be forwarded to the Patent Issue Division. A decision of the primary examiner to allow an application will not be subject to petition by any protester.

C. MARSHALL DANN,
Commissioner of Patents.

May 7, 1974.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,524,149, R. E. Vanderhide, AUTOMATIC DRILLING MACHINE, **filed** Oct. 2, 1973, D.C., N.D. Ohio (Cleveland), Doc. C-73-1025, *Robert E. Vanderhide* v. *Brown & Sharpe Manufacturing Co., Inc.*

3,002,770, Chesnut and Singalewitch, THREADED JOINT WITH LUBRICATING AND SEALING RIBBON INTERPOSED BETWEEN THE THREADS, **filed** Feb. 24, 1972, D.C. Del. (Wilmington), Doc. 4334, *Johnson & Johnson* v. *W. L. Gore & Associates, Inc.*

3,051,464, Yeo and Wald, AIR-HEATING GAS BURNER; **Re. 25,626,** same, **filed** Jan. 23, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c132, *Maxon Premix Burner Company, Inc.* v. *Eclipse Fuel Engineering Company and Morrill and Moeller, Inc.* Enter order supplementing judgment order pursuant to stipulation accounting is waived, reissue claims are dismissed with prejudice and defendant shall return to plaintiff certain documents in connection with this action, Sept. 28, 1973. **Same, filed** Nov. 21, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2942, *Eclipse Fuel Eng. Co.* v. *Maxon Corp.* Enter stipulated order of dismissal that all counts of complaint are dismissed with prejudice, and the Maxon counterclaim is dismissed without prejudice, Sept. 28, 1973.

3,091,434, D. S. Monitor, FAIRED CABLE DRIVE SYSTEM; **3,340,720,** G. N. Chartier, AUTOMOBILE REPAIR TOOL; **3,611,575,** same, AUTO FRAME ALIGNMENT APPARATUS; **3,635,434,** G. Chartier, WHEEL SUPPORT, **filed** Aug. 14, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73-1892-MML, *Guy-Chart Tools Ltd.* v. *American Best Tool Corp. and William T. Martin.*

3,285,602, P. H. Hartel, RECORD CARD FEED MECHANISM; **3,588,095,** Ward, Jr., Ward and Bachmann, Jr.; SUCTION TABLE SYSTEM FOR FEEDING OF WARPED SHEETS; **Reg. No. 906,827** (THE DESIGN WORKS OF BEDFORD-STUYVESANT AND DESIGN), The Design Works of Bedford-Stuyvesant, Inc., **filed** July 20, 1972, D.C.N.J. (Camden), Doc. C-1256-72, *The Ward Machinery Company* v. *The Langston Company.*

3,340,720. (See 3,091,434.)

3,424,480, R. W. Holland, CLOSURE CONNECTION MEANS FOR A HEAT EXCHANGER, **filed** Aug. 24, 1973, D.C., S.D. Tex. (Houston), Doc. CA 73–H–1196, *Richard W. Holland* v. *Bas-Tex Corporation.*

3,426,614, Brilando, Jameson and Blaho, TWIN CONTROL LEVEL ASSEMBLY; **3,477,303,** F. P. Brilando, DOUBLE PLATEAU SPROCKET ASSEMBLY; **D. 208,128,** Brilando, Jameson and Blaho, TWIN CONTROL LEVER ASSEMBLY FOR BICYCLES, **filed** Apr. 25, 1973, D.C., S.D. Calif. (San Diego), Doc. 73–157–T, *Schwinn Bicycle Company* v. *Beneficial Products, Inc.* Defendant permanently enjoined against infringing any claim of patents, Sept. 18, 1973.

3,432,793, Muska, Schacker and McHattie, GROUNDING CONNECTION FOR ELECTRICAL UNIT, **filed** Feb. 29, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c506, *William A. Muska et al.* v. *Wholesale Electrical Distributors et al.* Stipulation, enter order dismissing cause without costs, Nov. 5, 1972. **Same, filed** June 9, 1972, D.C. Conn. (New Haven), Doc. 15100, *Slater Electric Inc.* v. *Arrow-Hart, Inc.* Stipulation for dismissal, June 25, 1973.

3,440,525, C. P. Cardeiro, pH METER AND CONTROL SYSTEM, **filed** Aug. 28, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2212, *Universal Interloc, Inc.* v. *Leeds & Northrup Company.*

3,458,169, Eastwood, Brindle and Kolb, HOT TOP FOR BIG-END-UP INGOT MOLDS AND METHOD OF ASSEMBLING SAME, **filed** Dec. 8, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c3125, *Foseco International Limited* v. *Ogelbay Norton Co.* Enter judgment that the action be dismissed by agreement, July 23, 1973.

3,477,303. (See 3,426,614.)

3,486,640, J. H. Lemelson, MULTI-SPEED CONTROL SYSTEM FOR A LOAD CARRIER IN A WAREHOUSE SYSTEM, **filed** Aug. 6, 1973, D.C., N.D. Ohio (Cleveland), Doc. C–73–820, *The Triax Company* v. *TRW, Inc.*

3,552,469, L. M. Corless, TIRE BEAD SEATER; **3,675,705,** same, TIRE BEAD SEATING AND INFLATION APPARATUS, **filed** Aug. 23, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2174, *B & J Manufacturing Company* v. *Hennessy Industries, Inc.*

3,563,088, L. R. Sperberg, NON-DESTRUCTIVE METHOD OF DETERMINING TIRE LIFE, **filed** June 1, 1973, D.C., S.D.N.Y., Doc. 73–2454, *Uniroyal Inc.* v. *Lawrence R. Sperberg.* **Same, filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. C–73–801, *Lawrence R. Sperberg* v. *Goodyear Tire & Rubber Co.* **Same, filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. C–73–802, *Lawrence R. Sperberg* v. *The Firestone Tire & Rubber Co.* **Same, filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. 73–803, *Lawrence R. Sperberg* v. *The General Tire & Rubber Co.* **Same, filed** July 30, 1973, D.C., N.D. Ohio (Cleveland), Doc. C–73–804, *Lawrence R. Sperberg* v. *B. F. Goodrich Co.*

3,588,095. (See 3,285,602.)

3,611,575. (See 3,091,434.)

3,622,074, P. A. Frohwerk, MODULAR FLOATING WATER-COOLING SYSTEM, **filed** May 2, 1972, D.C., N.D. Calif. (San Francisco), Doc. C–72–775 AJZ, *Richards of Rockford, Inc.* v. *Ceramic Cooling Tower Company.*

3,635,434. (See 3,091,434.)

3,670,689, M. Pappas, TILT-OPERATED HAND HELD GAS POWERED ACOUSTIC DEVICE, **filed** June 28, 1972, D.C., S.D.N.Y., Doc. 72–C–2756, *Falcon Safety Products Inc.* v. *Midway Radio & Television Corp.*

3,675,705. (See 3,552,469.)

3,695,643, J. D. Schmunk, CORRUGATED TUBE COUPLING MEANS, **filed** Mar. 19, 1973, D.C., M.D.N.C. (Greensboro), Doc. C–100–G–73, *Zarn, Inc.* v. *Hancor, Inc. and The Hancock Brick and Tile Co.*

3,696,952, B. A. Bodenheimer, BULK CARGO HANDLING SYSTEM AND METHOD, **filed** June 14, 1973, D.C.S.C. (Charleston), Doc. 73–609, *Sea-Land Service, Inc.* v. *Seatrain Lines, Inc.*

3,701,559, Marino and Marino, COMBINATION SLING AND UNITIZING MEANS, **filed** Mar. 1, 1973, D.C., E.D.N.C. (Wilson), Doc. 1305–C, *Marino Systems, Inc.* v. *George Arapage and Air Systems, Inc.*

3,712,024, E. R. Nankivell, INTEGRAL SADDLE TREE AND GROUND SEAT, **filed** July 13, 1973, D.C., M.D. Fla. (Orlando), Doc. 73–165–Orl–C, *Ralide, Inc.* v. *Poly-Wood, Inc.*

3,712,213, R. B. Flemino, PORTABLE CHECK PROTECTOR, **filed** Feb. 26, 1973, D.C. Minn. (St. Paul), Doc. 3–73–62–C, *Bandwagon, Inc.* v. *Golden Age Industries, Incorporated.*

Re. 25,626. (See 3,051,464.)

D. 208,128. (See 3,426,614.)

Reg. No. 906,827. (See 3,285,602.)

Certificates of Correction for the Week of June 4, 1974

D. 227,502	3,763,319	3,772,268	3,782,080
D. 229,502	3,763,320	3,772,805	3,782,295
P.P. 3,474	3,763,488	3,772,897	3,782,829
3,398,689	3,763,527	3,773,123	3,782,896
3,480,170	3,763,665	3,773,528	3,782,982
3,597,502	3,763,752	3,773,565	3,783,101
3,641,155	3,765,495	3,773,696	3,783,132
3,694,334	3,765,623	3,773,847	3,783,151
3,694,972	3,766,643	3,773,976	3,783,163
3,696,622	3,766,655	3,773,985	3,783,738
3,705,269	3,766,815	3,774,425	3,784,001
3,706,527	3,766,934	3,774,525	3,784,627
3,708,527	3,767,238	3,774,535	3,784,637
3,725,384	3,767,261	3,774,936	3,784,888
3,729,189	3,767,946	3,774,999	3,785,356
3,736,193	3,768,121	3,775,056	3,785,903
3,742,692	3,768,171	3,775,369	3,786,501
3,745,058	3,768,595	3,775,392	3,787,510
3,753,161	3,768,607	3,775,466	3,787,840
3,753,500	3,768,707	3,776,145	3,788,714
3,754,555	3,768,798	3,776,745	3,788,921
3,754,758	3,768,890	3,776,801	3,789,109
3,754,888	3,768,909	3,777,110	3,789,359
3,755,558	3,769,624	3,777,132	3,789,360
3,755,605	3,769,824	3,777,491	3,789,578
3,755,973	3,770,347	3,777,912	3,789,601
3,756,223	3,770,445	3,778,441	3,789,852
3,758,524	3,770,802	3,778,445	3,790,101
3,758,640	3,770,871	3,779,196	3,790,983
3,758,996	3,770,911	3,779,275	3,791,106
3,759,793	3,771,060	3,779,551	3,791,177
3,759,821	3,771,133	3,779,685	3,791,845
3,760,375	3,771,203	3,779,750	3,791,888
3,760,563	3,771,296	3,779,778	3,791,978
3,760,631	3,771,320	3,780,332	3,792,622
3,761,480	3,771,419	3,780,402	3,793,476
3,761,814	3,771,837	3,780,678	3,794,039
3,762,412	3,772,042	3,781,225	

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the licensing policy of each agency-sponsor.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each.

Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 310,037. Air Floatation Cargo Handling System. Filed Nov. 28, 1972. PC $4/MF $1.45.

Patent application 314,053. Time Differentiating Passive Impulse Gage. Filed Dec. 11, 1972. PC $4/MF $1.45.

Patent application 315,748. Adapter for Installing Components in Wire Harness. Filed Dec. 15, 1972. PC $4/MF $1.45.

Patent application 343,315. Mechanical Door Interlock System. Filed Mar. 21, 1973. PC $4/MF $1.45.

Patent application 392,376. Balance Type Angle of Attach Indicator. Filed Aug. 28, 1973. PC $4/MF $1.45.

Patent application 392,377. Shock Heated, Wall Confined Fusion Power System. Filed Aug. 28, 1973. PC $4/MF $1.45.

Patent application 392,378. Method of Making Substrates for Microwave Microstrip Circuits. Filed Aug. 28, 1973. PC $4/MF $1.45.

Patent application 392,386. V-Band Coupling. Filed Aug. 28, 1973. PC $4/MF $1.45.

U.S. DEPARTMENT OF AGRICULTURE
Chief, Research Agreements and Patent Mgmt. Branch, Federal Building, General Services Division, Agricultural Research Service, Hyattsville, Md. 20782

Patent application 293,744. Activated, Recurable, Durable-Press Fabrics. Filed Sept. 29, 1972. PC $4.25/MF $1.45.

Patent application 328,198. Water Repellent Cotten Textiles. Filed Jan. 31, 1973. PC $4/MF $1.45.

Patent application 334,318. N-Substituted Fatty Acid Amide Lubricants. Filed Feb. 21, 1973. PC $5.25/MF $1.45.

Patent application 348,530. Catalyst Assist Agents Using Leaving Group Effects. Filed Apr. 6, 1974. PC $4/MF $1.45.

Patent application 348,555. Uniform Planar Strain Tester. Filed Apr. 6, 1973. PC $4/MF $1.45.

Patent application 348,557. A Durable-Press Starch Finish for Cotton and Cotton/Polyester Textiles. Filed Apr. 6, 1973. PC $4/MF $1.45.

Patent application 351,936. Fiber Condenser for Textile Processing. Filed Apr. 17, 1973. PC $4/MF $1.45.

Patent application 365,899. Pyrolyzed Rosin Products as Synthetic Rubber Tackifiers. Filed June 1, 1973. PC $4/MF $1.45.

Patent application 368,280. Boll-Weevil Sex Attractant. Filed May 14, 1973. PC $4/MF $1.45.

Patent 3,713,979. Production of Mannans by Fermentation. Filed May 28, 1971. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,745,088. Active Water-Insoluble Enzymes. Filed Dec. 23, 1970. Patented July 10, 1973. Not available NTIS.

Patent 3,749,681. Catalyst for Selective Hydrogenation of Polyunsaturated Vegetable Oils. Filed Feb. 26, 1971. Patented July 31, 1973. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 300 7th St. SW., Washington, D.C. 20590

Patent application 453,332. Magnetic Gradient Vehicle Detector. Filed Mar. 21, 1974. PC $4/MF $1.45.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent application 440,432. Chemical Mining of Copper Porphyry Ores. Filed Feb. 7, 1974. PC $4/MF $1.45.

Patent application 447,716. Chemical Mining of Copper Porphyry Ores. Filed Mar. 4, 1974. PC $4/MF $1.45.

Patent 2,810,637. Method of Extracting Aluminum From Aluminum-Silicon Alloys by Low Pressure. Filed Feb. 13, 1953. Patented Oct. 22, 1957. Not available NTIS.

Patent 2,996,292. Gravity-Fed Combustion Equipment Applying Crossfeed Ignition Principle. Filed June 12, 1958. Patented Aug. 15, 1961. Not available NTIS.

Patent 3,005,690. Multiple Compartment Rotary Drum for the Leaching of Ores or Related Products in a Continuous Countercurrent System. Filed Jan. 15, 1960. Patented Oct. 24, 1961. Not available NTIS.

Patent 3,075,710. Process for Wet Grinding Solids to Extreme Fineness. Filed July 18, 1960. Patented Jan. 29, 1963. Not available NTIS.

Patent 3,195,354. Inclined-Piston Dead-Weight Pressure Gauge. Filed Feb. 29, 1963. Patented July 20, 1965. Not available NTIS.

Patent 3,238,652. Mechanical Programming Device. Filed Dec. 31, 1963. Patented Mar. 8, 1966. Not available NTIS.

Patent 3,243,889. Elimination of Agglomeration by Freezing of Lignite or Other Moisture-Containing or Wetted Aggregates During Shipment. Filed Apr. 23, 1963. Patented Apr. 5, 1966. Not available NTIS.

Patent 3,244,475. Solvent Extraction Process for Separating Rhenium From Molybdenum. Filed Oct. 31, 1962. Patented Apr. 5, 1966. Not available NTIS.

Patent 3,244,480. Synthesis of Fibrous Silicon Nitride. Filed Mar. 3, 1964. Patented Apr. 5, 1966. Not available NTIS.

Patent 3,746,552. Gasification of Carbonaceous Solids. Filed Sept. 22, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,794,420. Photomechanical Apparatus for Manipulating Image Form. Filed Feb. 8, 1973. Patented Feb. 26, 1974. Not available NTIS.

Patent 3,798,140. Process for Producing Aluminum and Silicon From Aluminum Silicon Alloys. Filed Feb. 1, 1973. Patented Mar. 19, 1974. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 393,524. Shared Memory for a Fault-Tolerant Computer. Filed Aug. 31, 1973. PC $4.25/MF $1.45.

Patent application 428,994. Digital Transmitter for Data Bus Communications System. Filed Dec. 27, 1973. PC $4/MF $1.45.

Patent application 429,437. Wide Angle Sun Sensor. Filed Dec. 28, 1973. PC $4/MF $1.45.

Patent application 446,562. Combined Dual Scatter, Local Oscillator Laser Doppler Velocimeter. Filed Mar. 28, 1974. PC $4/MF $1.45.

Patent application 447,124. Flow Measuring Apparatus. Filed Feb. 28, 1974. PC $4/MF $1.45.

Patent application 449,118. Motor Run-Up System. Filed Mar. 7, 1974. PC $4.25/MF $1.45.

Patent 3,789,920. Heat Transfer Device. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,789,947. Omnidirectional Wheel. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,790,432. Reinforced Polyquinoxaline Gasket and Method of Preparing the Same. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,790,795. High Field CDS Detector for Infrared Radiation. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,790,906. System for Stabilizing Cable Phase Delay Utilizing a Coaxial Cable Under Pressure. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,792,399. Banded Transformer Cores. Patented Feb. 12, 1974. Not available NTIS.

Patent 3,793,109. Method of Fabricating an Article With Cavities. Patented Feb. 19, 1974. Not available NTIS.

Patent 3,795,858. Inverter Ratio Failure Detector. Patented Mar. 5, 1974. Not available NTIS.

Patent 3,795,862. Demodulator for Carrier Transducers. Patented Mar. 5, 1974. Not available NTIS.

Patent 3,795,900. Multifunction Audio Digitizer. Patented Mar. 5, 1974. Not available NTIS.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 11, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-07-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-12-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	4-24-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-01-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-01-73
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-03-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-11-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-02-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-14-73
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-09-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-15-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-10-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-07-73
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-09-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-08-73
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-09-73

Expiration of patents: The patents within the range of numbers indicated below expire during May 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,790,971 to 2,794,185, inclusive
Plant Patents..... Numbers 1,598 to 1,605, inclusive

REISSUES

JUNE 4, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,027
COLD ROLLING WORK ROLL

Max E. Bills, Pleasant Hills Borough, Pa., and Henry J. Hansen, Jr., Portage, Ind., assignors to United States Steel Corp.

Original No. 3,619,881, dated Nov. 16, 1971, Ser. No. 792,079, Jan. 17, 1969. Application for reissue Mar. 30, 1973, Ser. No. 346,554

Int. Cl. B21b *27/02*

U.S. Cl. 29—121 R **2 Claims**

A work roll for cold rolling steel sheets or strip has a plurality of shallow generally frustospherical depressions in its outer surface. The vast majority of the depressions are of substantially uniform shape and depth, but may be randomly spaced over the roll surface. When the sheet is rolled between two rolls, at least one of which has the described surface, low generally frustospherical projections of substantially uniform shape and height are obtained on that side of the strip in contact with the surfaced roll.

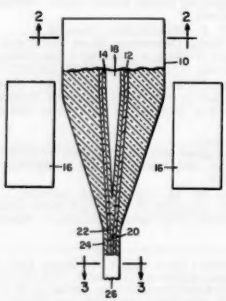
28,028
METHOD OF FORMING AN ECONOMIC OPTICAL WAVEGUIDE FIBER

Robert D. Maurer, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Original No. 3,737,293, dated June 5, 1973, Ser. No. 214,842, Jan. 3, 1972. Application for reissue June 21, 1973, Ser. No. 372,086

Int. Cl. C03c *25/06*

U.S. Cl. 65—3 **18 Claims**



A method of forming an optical waveguide by first forming a coating of glass on the inside wall of a glass tube, the glass tube and the first coating being of substantially similar material. Thereafter, a second coating of glass is applied to the inside wall of the glass tube over the first coating, said second coating having a preselected different index of refraction from that of the first coating. The glass tube and coating combination is thereafter drawn to reduce the cross-sectional area and to collapse the second and inner coating of glass to form a fiber having a solid cross-sectional area. The collapsed inner coating forms the fiber core and the first coating forms the cladding for the fiber while the exterior glass tube provides structural strength for the fiber.

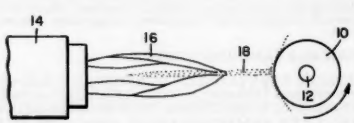
28,029
METHOD OF FORMING OPTICAL WAVEGUIDE FIBERS

Donald B. Keck, Big Flats, Peter C. Schultz, Painted Post, and Frank Zimar, Hammondsport, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Original No. 3,737,292, dated June 5, 1973, Ser. No. 214,841, Jan. 3, 1972. Application for reissue June 21, 1973, Ser. No. 372,338

Int. Cl. C03c *25/06*

U.S. Cl. 65—3 **17 Claims**



A method of forming an optical waveguide by forming a first coating of glass having a predetermined index of refraction on the outside peripheral wall surface of a substantially cylindrical starter rod or member. Thereafter, a second coating of glass is applied to the peripheral outside surface of the first coating, said second coating having a preselected index of refraction less than the index of refraction of the first coating. The starter rod or member is removed from the assembly following the application of either the first or second coating. The resulting substantially cylindrical hollow assembly is heated and drawn to reduce the cross-sectional area and to collapse the first and inner coating of glass to form a fiber having a solid cross-sectional area. The collapsed first and inner coating forms the fiber core and the second cotaing forms the cladding for the fiber.

28,030
HYDRAULIC CONTROL ASSEMBLY

Clyde R. Porter, Los Angeles, and Joseph A. Sember, Glendale, Calif., assignors to P. L. Porter Co., Los Angeles, Calif.

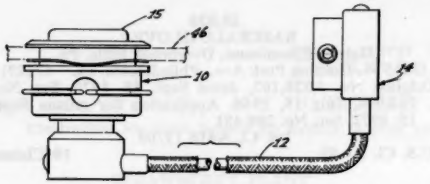
Original No. 3,553,967, dated Jan. 12, 1971, Ser. No. 846,781, Aug. 1, 1969. Application for reissue Nov. 26, 1971, Ser. No. 202,229

Int. Cl. F10j *1/00;* **F15b** *7/00;* **G12b** *9/00*

U.S. Cl. 60—54.5 R **23 Claims**

A plunger of a control unit displaces a movable wall for corresponding hydraulic displacement of a moveable

wall of a remote operating unit. The control unit itself is designed for assembly by snap action and is also constructed for mounting on the control panel by snap action.

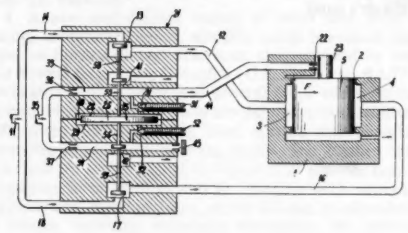


28,031

FLUID DEVICE FOR STABILIZING THE POSITION OF A MOVING ELEMENT

Andre Fortier, 12 Rue Leon Cambillard, Clamart 92, France

Original No. 3,697,142, dated Oct. 10, 1972, Ser. No. 30,510, Apr. 21, 1970. Application for reissue Mar. 22, 1973, Ser. No. 343,935
Claims priority, application France, Apr. 23, 1969, 6912767
Int. Cl. F16c *1/24*
U.S. Cl. 308—5 R **4 Claims**



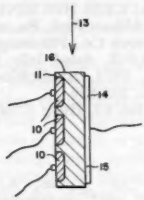
There is described a pneumatic control system for varying pneumatic pressure on opposite sides of a pneumatic bearing so that a variable lateral force on a shaft supported by the bearing may be balanced so as to minimize undesirable lateral displacement of the shaft. The system includes a control device in which primary and secondary pneumatic circuits are separated by a movable diaphragm which moves along so as to vary the pressure on opposite sides of the bearing. The primary and secondary circuits are supplied with pneumatic fluid separately from a pneumatic supply for the bearing. The primary circuit pressure acts on one side of the diaphragm through a first adjustable throttle and responds to pressure variation produced by a sensing jet placed in close proximity to the shaft. The secondary circuit pressure acts on the opposite side of the diaphragm through a second adjustable throttle and contains a reference jet. Both primary and secondary circuits contain variable vents or restrictions to atmosphere which are simultaneously opened or closed depending upon the direction of diaphragm movement. All valve elements are independent members, but move simultaneously with the diaphragm. The system described enables a pneumatically supported shaft to be accurately position-controlled against displacement by lateral variable force.

28,032

MULTICOLOR PHOTOVOLTAIC DEVICE

Myrsyl W. Scott and Ernest L. Stelzer, Minnetonka, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Original No. 3,638,026, dated Jan. 25, 1972, Ser. No. 50,484, June 29, 1970. Application for reissue Feb. 12, 1973, Ser. No. 331,399
Int. Cl. H01j *39/12*
U.S. Cl. 250—211 J **26 Claims**



A photovoltaic device having peak response at several different wavelengths is formed by a body of a semiconductor alloy material having a compositional gradient and containing diffused PN-junctions in regions of different composition, the energy gap of the material being dependent upon the composition of the alloy.

28,033

CALCULATOR FOR MAKING PATTERNS

Joseph E. Hannon, 943 W. Greenbriar Lane, Dallas, Tex. 75208

Original No. 3,572,583, dated Mar. 30, 1971, Ser. No. 771,187, Oct. 28, 1968. Application for reissue May 23, 1972, Ser. No. 256,186
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **12 Claims**

This disclosure provides a method and a tool for simplying the art of pattern making while simultaneously increasing the accuracy of the patterns made. One embodiment of this tool is a slide rule (known as a "pattern rule") so constructed as to directly compute and display the dimensions required in a pattern layout. By inserting the known dimensions and requirements into one area of the pattern rule by physically moving a sliding rule member, the desired dimensions are displayed in another area of the rule.

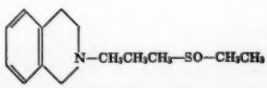
28,034

N-ALKYLSULFINYLALKYL- AND SULFONYLALKYL-1,2,3,4-TETRAHYDROISOQUINOLINES

Allan Poe Gray, Essex Junction, Vt., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

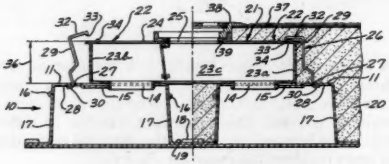
No Drawing. Original No. 3,549,640, dated Dec. 22, 1970, Ser. No. 680,354, Nov. 3, 1967. Application for reissue Dec. 14, 1972, Ser. No. 314,968
Int. Cl. C07d *35/42*
U.S. Cl. 260—283 S **8 Claims**

N-substituted 1,2,3,4 - tetrahydroisoquinolines exemplified by 2-(3-ethylsulfinylpropyl) - 1,2,3,4 - tetrahydroisoquinoline.



exert cardiovascular effects when administered as their hydrochlorides. Such sulfinyl compounds are prepared by oxidation of the corresponding thio ethers, which may also be oxidized to the corresponding sulfonyl compounds. Substitution on the aromatic and heterocyclic rings and variations in the side chain are disclosed.

28,035
HOLD-DOWN MEANS FOR UNDERFLOOR ACCESS HOUSING
Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Co., Pittsburgh, Pa.
Original No. 3,676,568, dated July 11, 1972, Ser. No. 161,221, July 9, 1971. Application for reissue June 22, 1973, Ser. No. 372,826
Int. Cl. H02g *3/04*
U.S. Cl. 174—49 **9 Claims**



An underfloor access housing adapted for use with electrical raceway units of the type normally placed in building floors. The access housing spans the distance between adjacent cells and overlies the crests thereof. Separate hold-down means are provided for quickly connecting the access housing to the raceway unit.

28,036
BASEBALL GLOVE
Harold Rosenbaum, Overbrook Hills, Pa. (2615 W. Hunting Park Ave., Philadelphia, Pa. 19129)
Original No. 3,528,107, dated Sept. 15, 1970, Ser. No. 744,904, July 15, 1968. Application for reissue Sept. 15, 1972, Ser. No. 289,451
Int. Cl. A41d *13/08*
U.S. Cl. 2—19 **10 Claims**

A baseball infielder's glove is disclosed having a one-piece back notched for adjustment. The construction of the back facilitates the provision of a better pocket, prevents slipping of the glove off the player's hand, enables welts along the finger positions to be eliminated, while providing for maximum safety against spiking the back of the player's hand.

PLANT PATENTS

GRANTED JUNE 4, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,561
STRAWBERRY PLANT
Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Filed Dec. 29, 1972, Ser. No. 319,275
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct strawberry variety described and illustrated, and characterized particularly by its adaptability to summer planting in all growing areas of California, its long conic fruit shape with a tendency to be flat, high productivity, desirable growth pattern, and excellent dessert, shipping and handling qualities.

3,562
ROSE PLANT
Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277
Filed Jan. 16, 1973, Ser. No. 324,177
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—24 **1 Claim**

1. A new and distinct variety of moss rose plant of hardy, moderately dwarf, upright, much branched, bush type, as illustrated and described, characterized by buds and flowers resembling Greenfire (U.S. Plant Pat. #1,776) floribunda rose in color and general color effect; further characterized by flower buds having numerous, relatively soft, green thorns covering basal portion with abundant moss-like appendages covering sepals; and further characterized by a plant which is vigorous in growth, easy to propagate from cuttings and by budding, with abundant medium size, medium green, glossy foliage, an abundance of bloom, recurring repeatedly throughout the growing season with flowers borne singly and in loose cluster of 3 to 5.

3,563
ROSE PLANT
Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277
Filed Jan. 16, 1973, Ser. No. 324,178
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct variety of hybrid moss rose plant of hardy, moderately dwarf, much branched, upright, bush type, as illustrated and described, characterized by resemblance to the Baccara rose (U.S. Plant Pat. #1,367) in general form of bud and flower and flower color, the general color effect of the freshly opened flower being an all over orange-red (scarlet red) color of uniform shade, the flowers having good lasting quality both on the plant and as cut flowers; the buds especially characterized by the moss-like appendages consisting of extra foliar parts and small hair-like growths terminating in dark ball-like oil glands; and further characterized by a plant of the floribunda type which is moderately dwarf, much branched, and vigorous in growth, easy to propagate from cuttings and by budding: with medium to large, dark green foliage, an abundance of bloom borne in repeated succession throughout the growing season with flowers borne singly and in loose clusters of 3 to 5 on strong stems.

3,564
POINSETTIA PLANT
Thormod Hegg, P.O. Box 66, Reistad, Norway N-3425
Filed Jan. 29, 1973, Ser. No. 327,819
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a semi-dwarf, self-branching and strong habit of growth, with short internodes, which makes the plant very attractive for pot plant production, strong, thick, stiff and free-branching stems on which the bracts and flowers can be easily shaped to make a well-proportioned plant, distinctive and attractive shiny dark green leaves, which are rough textured and leathery in appearance on their upper surfaces, with the leaves being prominently veined and more strong lobed than those of other varieties, a distinctive and attractive deep orange-red bract color, a long-lasting plant habit, and an ability to be easily brought into flower at any time of the year by subjecting the same to short day treatment.

3,565
JUNIPER PLANT
Peter Mordigan, Sylmar, Calif., assignor to Select Nurseries, Inc., Brea, Calif.
Filed Mar. 26, 1973, Ser. No. 344,497
Int. Cl. A01h *7/00*
U.S. Cl. Plt.—50 **1 Claim**

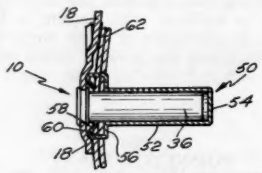
1. A new and distinct variety of juniper plant substantially as shown and described, characterized by its dwarf size, its slow hardy upright growth habit, its many upwardly extending branches forming a tightly compact bush that is broadly conical having a pointed tip, its resinous foilage that is tightly appressed at first having a tendency to spread somewhat as the leaves mature with said leaves becoming spinescent on the underside, and by the absence of cones and seed.

PATENTS

GRANTED JUNE 4, 1974

GENERAL AND MECHANICAL

3,813,694
TIE FORM CONSTRUCTION
Nils A. Ellin, 976 Main St., Warren, R.I. 02885
Filed Mar. 5, 1973, Ser. No. 338,330
Int. Cl. A41d *25/14*
U.S. Cl. 2—153 **3 Claims**

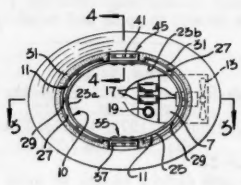


A tie form construction for use with a ready-made tie having a clip assembly formed of a metallic material in a one-piece construction and to which a spring member and pin are joined. The pin and spring member are designed to attach the necktie to a shirt collar. After the tie is mounted on the clip, a hollow tubular lock member is slipped over the pin. The bottom edge of the lock member is provided with integral tines extending parallel to the axis of the lock member. The clip is provided with a dished area surrounding the pin. When the lock member is forced down over the pin, the tines will pierce the tie material and bear against the dished area. This causes the tines to bend reentrantly and lock the tie material in place and to the clip.

3,813,695
SURGICAL GLOVE
David L. Podell, Jr., 67 East 78 St., New York, N.Y. 10021, and Howard I. Podell, 6 Dawes Pl., Larchmont, N.Y. 10538
Filed Feb. 21, 1973, Ser. No. 334,459
Int. Cl. A41d *19/00*
U.S. Cl. 2—168 **8 Claims**

A rubber or latex glove of the type used by surgeons which is laminated wtth an internal plastic lining of hydrophilic material. The hydrophilic lining reduces the friction between the glove and the hand of the user as the glove is applied or removed, and eliminates the necessity conventional lubricating powders such as talc which may contaminate the surgical procedures. The lamina may be formed of the type of plastic known as hydro gels.

3,813,696
POWER VENTILATED HELMET
Garlen F. Yeager, 232 Roderick, St. Louis County, Mo. 63137
Filed Nov. 13, 1972, Ser. No. 306,005
Int. Cl. A42c *5/04*
U.S. Cl. 2—171.3 **8 Claims**

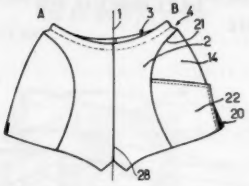


A power ventilated helmet having an opening in the crown portion thereof for the passage of air therethrough and an adjustable headband for supporting the helmet on the wearer's head. One or more air passages are provided in the space between the inner surface of the headband and the inner surface of the helmet, and compressible foam material is disposed between the headband and the helmet for substantially blocking the flow of air between the helmet and the headband. The helmet further includes a blower operable either to draw air in through the wearer's head and to exhaust the air downwardly through the air passages over the wearer's head, or to draw air in through the air passages up over the wearer's face and head, to draw it between the inner surface of the helmet and the wearer's head and then to exhaust it from the opening. These air passages are of substantially constant cross sectional area regardless of the size to which the headband is adjusted to insure that the blower forces air through the air passages at a desired rate regardless of the size to which the headband is adjusted.

3,813,697
PANTS
Charles H. Belpaume, Bouc-Bel-Air, France, assignor to Societe Anonyme dite: Innovations Pour l'Elegance Masculine, Marseille, France
Filed Aug. 10, 1973, Ser. No. 387,439
Int. Cl. A41d *1/06*
U.S. Cl. 2—227 **8 Claims**

A pair of pants comprises two hip pieces, front and back wings joined to lateral edges of the hip portions and a waistband portion. Vertical front and back seams join right and left sides of the garment each comprising a hip portion, a front wing and a back wing. Opposite lateral edges of the hip

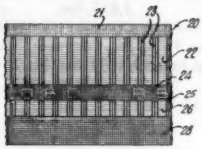
pieces have upper portions that are convexly curved and diverge from a median axis and lower portions that are approximately straight. In one embodiment the waistband portion is formed by integral portions joining the front and back wings on each side. In another embodiment the waistband is a separate piece. The pants may have short legs or long legs as desired.



3,813,698
TROUSERS HAVING NARROW ELASTIC FABRIC WAISTBAND

Roger G. Campbell, Sr.; Richard E. Goff, Jr., and Joseph A. Priestley, all of Barrington, R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 146,938, May 26, 1971. This application May 29, 1973, Ser. No. 364,389
Int. Cl. A41f 9/00
U.S. Cl. 2—237 **3 Claims**



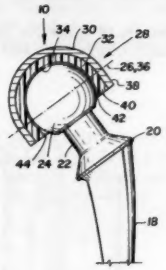
A narrow elastic fabric for use as a waistband in an article of apparel comprising a set of warp yarns running in the direction of the length of the fabric interwoven with a set of filling yarns running in the direction of the width of the fabric. From 10% to 50% of the number of yarns in the warp set being elastic yarns with the remaining yarns nonelastic. The elastic yarns having a spandex core initially wrapped with a settable yarn. The warp and filling yarns being woven in a pronounced rib weave over at least a portion of the width of the fabric with the ribs running in the direction of the width of the fabric.

3,813,699
PROSTHETIC HIP JOINT

Richard P. Giliberty, 824 Hunt Lane, Manhasset, N.Y. 11030

Filed Jan. 15, 1973, Ser. No. 323,828
Int. Cl. A61f 1/24
U.S. Cl. 3—1 **10 Claims**

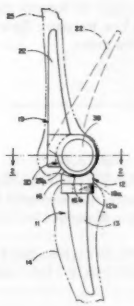
A prosthetic device and more particularly a hip-joint prosthesis having a fully assembled composite structure of a femoral head, neck and shank to be positioned in and on the femur, a cup for positioning in the acetabulum for relative articulation therein to closely approximate the anatomical function of the natural femur head and acetabulum joint with the femoral head and cup being connected with each other to restrain their separation, but to permit their relative movement.



3,813,700
PROSTHETIC KNEE DEVICE

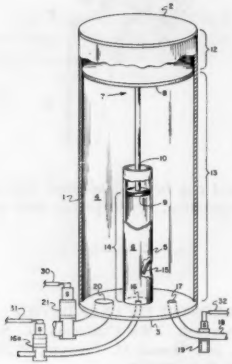
Richard R. Tavernetti, 2300 California St., San Francisco, Calif. 94115, and Samuel M. Tennant, 2721 Coral Ridge Rd., Miraleste, Calif. 90732

Filed Apr. 16, 1973, Ser. No. 351,566
Int. Cl. A61f 1/24
U.S. Cl. 3—1 **9 Claims**



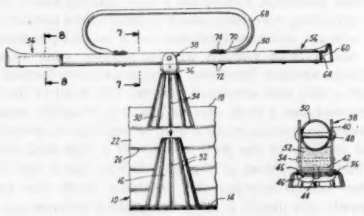
A first prosthetic fixture has a head portion with a fixation stem extending therefrom which is fitted into a prepared cavity in a femur and cemented thereto. A second prosthetic fixture has a head portion with a fixation stem extending therefrom which is fitted into a prepared cavity formed in the end of a tibia and cemented thereto. The head of the femur fixture includes a shaft therein which is rotatably supported for single axis rotation on a pair of bearings to provide torsional stability to the joint along with a high load handling capability. The head of the tibia fixture has a slot formed therein which engages the rotatable shaft for rotation therewith, this slotted portion being fitted between side faces of the bearing fitted into the femur fixture head so as to retain the tibia fixture against major lateral movement. The tibia fixture is fitted with a set of bearing blocks which ride on the outer surfaces of the femoral fixture to provide a large diameter bearing surface concentric with the center shaft to carry the normal axial load and to provide for minor lateral stability associated with standing and walking. The two head members may be joined together after the fixtures are set in their respective associated bone portions to form an articulated joint rotatable about a single axis and stabilized against lateral and torsional movements.

3,813,701
WATER-CONSERVING PRESSURE CONVERTER
Elbert M. Stevens, 1000 N. Alamo St., San Antonio, Tex. 78215
Filed Dec. 18, 1972, Ser. No. 315,872
Int. Cl. E03d 3/00, 3/04
U.S. Cl. 4—26 6 Claims



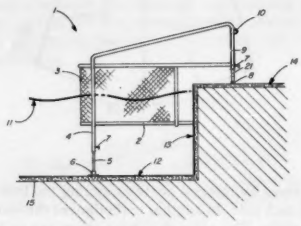
A water-control unit for toilets which uses a pressure-boosting, differential-piston unit to supply either high pressure water or both high and low pressure flows to minimize volumetric consumption of the toilet.

3,813,702
POOL WITH TWIRLING SEESAW
Joseph Diemond, Simsbury, and Leonard E. Greenberg, West Hartford, both of Conn., assignors to Coleco Industries, Inc., Hartford, Conn.
Filed Oct. 27, 1971, Ser. No. 193,087
Int. Cl. E04h 3/18, 3/19; A63g 11/00; A63h 23/16, 33/08
U.S. Cl. 4—172 14 Claims



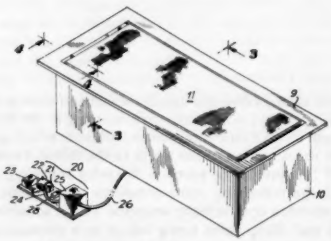
A seesaw pool assembly incorporates a synthetic plastic pool member having a post centrally thereof and a seesaw assembly mounted on the post including an elongated seesaw member with seat portions upon which children may seat themselves so as to pivot the elongated seesaw member upwardly and downwardly. In its preferred aspect, the seesaw assembly also permits rotation of the elongated seesaw member to provide twirling action.

3,813,703
NOVEL SAFETY SWIMMING POOL WADING PLATFORM
Gerald P. Beaudin, Jr., 769 Mont Vista Ln., Rochester, N.Y.
Filed Sept. 17, 1973, Ser. No. 397,934
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172 7 Claims



A novel safety swimming pool wading platform is described. The wading platform is used in conjunction with a regular size swimming pool and is especially designed for use by small children. It has a base supported by four legs and a railing. A front set of legs are adjustable and are designed to rest in a non-skid manner on the bottom of an existing pool. A rear set of legs are also adjustable and are designed to rest on the edge of the pool. The platform base is immersed under water and adjusted to any desired depth and typically to a depth sufficient to permit the heads of small children to remain above water while they are in a standing position. The depth of the platform is adjusted by adjusting the length of the front and rear legs. For safety purposes, the wading platform may be enclosed by a net to prevent users from stepping off the edge into water over their heads.

3,813,704
FLOATABLE SAFETY COVER FOR SWIMMING POOLS
Daniel A. Troiano, 9 Pam Dr., Commack, N.Y. 11725
Filed June 19, 1972, Ser. No. 264,386
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172.13 15 Claims



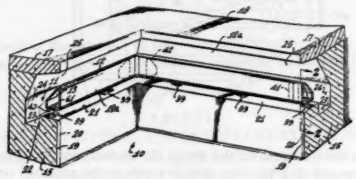
A platform of perforated, semi-rigid sheet material is supported on a frame of rigid, pressure-tight tubing. The shape of the platform corresponds to the perimeter of the water surface in the protected pool. The platform, in its operating position, is supported by a number of inflatable floatation pillows whose displacement is varied by the control of the pressure level of compressed air entrapped therein. The tubular frame serves as distribution manifold for the compressed air and is connected to a pressure-sensitive alarm device. The alarm device provides an audible warning signal whenever the excess buoyancy of the platform drops below the weight of a person accidentally stepping thereon.

3,813,705

GUTTER-TYPE SWIMMING POOL CONSTRUCTION

Milton K. Spaulding, 2715 Exeter Pl., Santa Barbara, Calif. 93105

Filed Sept. 1, 1971, Ser. No. 176,886
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172.18 18 Claims



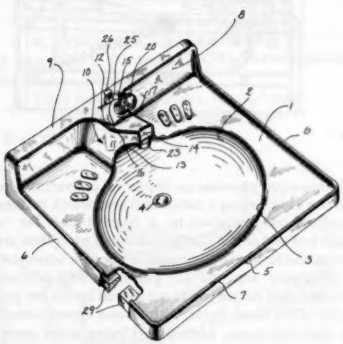
A swimming pool with a hand-hold and gutter lip comprising shaped pre-fabricated sections connected in end-to-end relation by telescoping connectors along the sidewalls and at the corners, each lip section being adjustably supported on screw jacks connected to the sections and mounted on the sidewalls on anchors installed at intervals according to a predetermined plan. Water from the gutter is returned to the pool through a corner connector having a return fitting communicating with the conduit in the lip, and through outlets drilled in the lip in selected locations.

3,813,706

LAVATORY WITH INTEGRALLY MOLDED FIXTURE

Frank N. Williams, Aurora, Ill., assignor to Federal-Huber Corp., Plano, Ill.

Filed May 8, 1972, Ser. No. 251,610
Int. Cl. E03c 1/18; A47k 1/04
U.S. Cl. 4—187 R 2 Claims



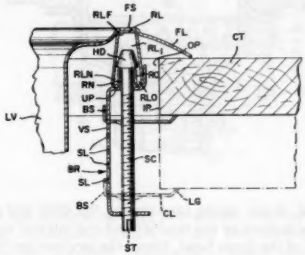
A lavatory made of single molded plastic sheet with reinforcing on its underside is shaped to have a substantially flat counter portion, an upwardly rising back wall along the rear of the counter portion, a bowl rimmed by the counter portion, and a spout shaped fixture portion located between the back wall and the bowl. The fixture has a pair of spaced side walls rising up from the counter portion and extending forward from the back wall, a top side spanning between the side walls, and an underside which rises from the rear wall of the bowl in an arch to extend out over the bowl and join with the side walls and top to form the spout. A valve is mounted on the top side of the fixture portion.

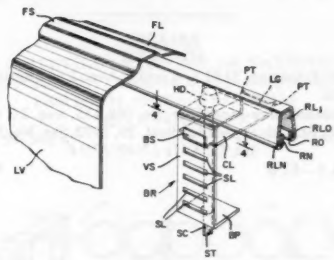
3,813,707

LAVATORY MOUNTING STRUCTURE

Andrew J. Fowell, Martinsville, N.J., assignor to American Standard Inc., New York, N.Y.

Filed May 21, 1973, Ser. No. 362,605
Int. Cl. E03c 1/18
U.S. Cl. 4—187 A 11 Claims





This application covers an arrangement for connecting a sink or lavatory within the opening of a countertop, the connecting means including a clamp structure for establishing a firm connection between the units regardless of the thickness or depth of the countertop. A rail or rails may be welded or otherwise affixed to the underside of the lavatory and each such rail includes two similar U-shaped members for receiving between them and supporting the head of an elongated screw. The screw is adjustably mounted on an elongated bracket of uniform width which provides a plurality of narrow rectangular openings along its length for receiving one end of a clip of slightly lesser width which has an opening threadedly adjustable along the shank of the screw. The clip has an upturned end which has an angular disposition so that is may be driven against or into the underside of the countertop when the screw is adjusted in position. The other end of the clip is normal to the central segment of the clip and parallels the bracket. By having a plurality of similar narrow parallel openings in the bracket, the clip may be readily inserted through any one of the openings to meet the geometrical requirements for attachment to any countertop regardless of the thickness or depth of the countertop within a wide limiting range.

3,813,708

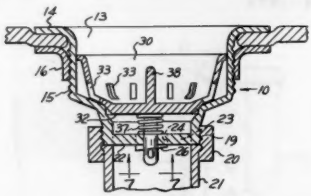
KITCHEN SINK STRAINER AND DRAIN BOWL UNIT

Jacob J. Hamburg, Oak Park, Mich., assignor to Admiral Marine Products Company, Detroit, Mich.

Filed Dec. 29, 1972, Ser. No. 319,888
Int. Cl. A47k 1/14; E03c 1/26, 1/262
U.S. Cl. 4—286 5 Claims

A drain bowl, fastened within the drain opening of a kitchen sink, is provided with a keyhole slot type opening through its bottom, with a wedge shaped cam formed around the opening

on the bottom surface of the drain bowl. A bowl-shaped strainer is nested within the drain bowl and has an integral central stem extending downwardly through the hole with a radial projection engaged with the cam beneath the drain bowl bottom to seal the strainer downwardly against the drain bowl

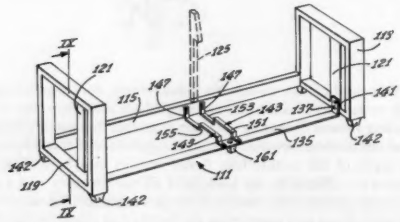


interior wall. A coil spring surrounding the stem and engaged between the bottom of the strainer and the interior surface of the bottom of the drain bowl, forces the strainer upwardly for spacing the strainer from the drain bowl, for drainage therebetween, when the strainer is rotated to disengage the projection from the cam.

3,813,709
SOFA-BED

David S. Friedman, 5101 S. Corning Ave., Los Angeles, Calif. 90056

Continuation-in-part of Ser. No. 168,135, Aug. 27, 1971, abandoned. This application Sept. 29, 1972, Ser. No. 293,369
Int. Cl. A47c *17/40, 17/14*
U.S. Cl. 5—12 R **9 Claims**



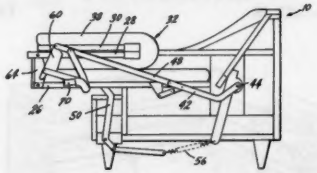
An article of furniture comprising a sofa having two distinct cooperating structural elements by means of which the sofa can be converted into a bed. One element basically comprises a supporting frame, a pair of arms, and a back frame. The second element comprises a base frame which is guided in sliding movement relative to the first element so that, in a first location, the article of furniture comprises a sofa and, in a second location, the article of furniture comprises a lounge or bed.

3,813,710
FOLDABLE BED BOTTOM FRAME ASSEMBLY FOR USE IN SOFA BEDS AND THE LIKE

George F. Janko, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Oct. 12, 1972, Ser. No. 297,058
Int. Cl. A47c *17/14, 13/00*
U.S. Cl. 5—13 **9 Claims**

A sofa bed comprising a hollow sofa frame, a foldable mattress support frame having a head section, a center section and a foot section that are hingedly connected together and are movable between a generally horizontal sleep position and a folded storage position within the sofa frame. The head section is longer than the other two sections to provide head and shoulder support for the user and to enable the foot section to be of cushion length when stored. The sections fold so as to

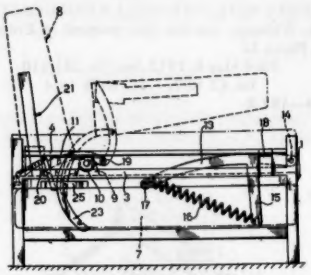


position the mattress on the top in the stored position for comfort purposes and the legs which support the sections on the floor in the sleep position swing into folded position in response to folding of the frame sections.

3,813,711
BED-SETTEE

Gastone Fiaschi, Quarrata, Italy, assignor to Lukas-Beddy S.p.A., Barba (Pistoia), Italy

Filed Nov. 24, 1972, Ser. No. 309,374
Claims priority, application Italy, Nov. 27, 1971, 70896/71; Sept. 19, 1972, 69958/71
Int. Cl. A47c *17/14, 17/36*
U.S. Cl. 5—24 **5 Claims**



This invention provides an improved convertible bed-settee unit of the kind having a movable frame which rotates about a longitudinal axis relative to a fixed frame for transition between bed and settee configurations. Two rollers are carried by the movable frame for rotation about a common longitudinal off-centre axis and are guided in end portions of the fixed frame, and respective three-armed levers are provided at each end of the fixed frame, with pivotal connections to centre of the movable frame, these levers being acted upon by traction springs which assist the transition of the movable frame between the two configurations of use of the unit, which may be constructed for conversion to a single or a double bed.

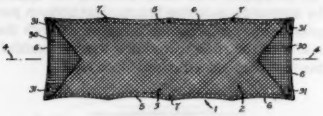
3,813,712
PATIENT STRETCHER TRANSPORT SYSTEM

Noel James Bonnin, Flat 4, 52 Brougham Pl., North Adelaide, Australia

Filed June 28, 1972, Ser. No. 266,997
Int. Cl. A47b *83/04;* **A61g** *1/02*
U.S. Cl. 5—82 **9 Claims**

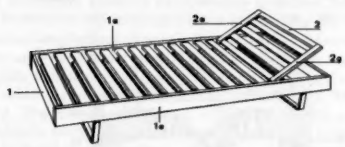
Patient stretcher apparatus wherein the threads of the supporting sheet are angularly positioned in relation to the length

of the sheet with the edges thereof loosely attached to a peripheral reinforcement, and attaching means securing cer-



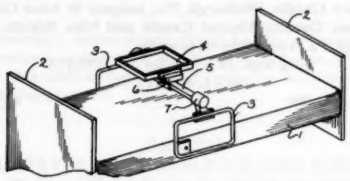
tain ends of the threads to side bars at spaced intervals, the opposite ends of said certain threads not being so fastened.

3,813,713
BEDSTEAD WITH SLATS OF DIFFERENT STIFFNESS
Fritz Kipfer, Widmerstr. 15, 8038 Zurich, Switzerland
Filed Mar. 27, 1972, Ser. No. 238,210
Claims priority, application Switzerland, May 18, 1971, 7263/71
Int. Cl. A47c *23/06*
U.S. Cl. 5—238 **2 Claims**



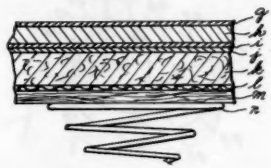
A bedstead with a reclining head-rest has a pair of longitudinal side members provided with spaced apart lateral pivots carrying swingable slat supports which are disposed opposite one another in pairs along the inner faces of the longitudinal members. Each pair of supports is provided with at least two angularly spaced slats of different stiffness so that either slat may be rotated into an operative position forming the support for the torso of the user.

3,813,714
PORTABLE TRAY SUPFORT
Robert R. Sater, c/o A. D. Morton Co., Inc. 4495 Industrial Pkwy., Willoughby, Ohio 44094
Filed Feb. 16, 1972, Ser. No. 226,821
Int. Cl. A47c *22/00;* **A63b** *23/04*
U.S. Cl. 5—332 **7 Claims**



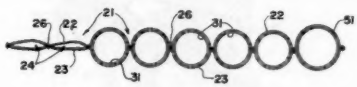
This disclosure is of a portable supporting construction primarily devised for use on or in connection with beds or wheel chairs, which construction includes a single support member having a mounting device at each end, which devices include means to facilitate rotative movement of the support member into various positions, in which positions the member may be locked, the member having adjustable means thereon which will engage a tray or the like, whereby the tray may be pivoted with the member and removed when desired, the tray or the like thus being angularly positioned with respect to the area over which it is supported when in use.

3,813,715
FIRE-RESISTANT CUSHIONED STRUCTURES
Arnold M. Sookne, Greensboro, S.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Oct. 11, 1972, Ser. No. 299,607
Int. Cl. A47c *23/00, 27/00*
U.S. Cl. 5—345 R **6 Claims**



Cushioned structures, e.g., mattresses, pillows, upholstery cushions, upholstered chairs, or the like rendered fire-resistant by an interliner comprising a fabric coated with a polymeric binder having dispersed therein from 30–60 percent by weight of a flake- or leaf-shaped, heat-conductive material.

3,813,716
LIGHTWEIGHT, COMPACT AIR MATTRESS
Jonathan Francis, 2217 Roosevelt Ave., Berkeley, Calif. 94703
Filed July 31, 1972, Ser. No. 276,425
Int. Cl. A47c *27/08*
U.S. Cl. 5—348 R **3 Claims**

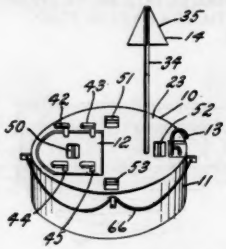


A lightweight, compact air mattress particularly suitable for use for backpacking is disclosed. The air mattress is comprised of a lightweight, thin walled casing having a plurality of side-by-side elongated pockets and a plurality of small diameter, individual, inflatable tubular members removably mounted in the pockets. Each inflatable tube has its own valve means for inflation thereof, and the tubular members are also formed of a thin, lightweight material such as polyvinyl chloride. The low volume tubes are inflated until fully distended to provide proper cushioning. The casing material is preferably a woven nylon and both the casing and tubes are abrasion and puncture resistant, but not puncture proof. Puncturing of the tubular members is tolerated, since they may be readily removed for repair or replacement.

3,813,717
LIFE RAFT
Harry X. Mousetis, 17 Old Farms Rd., Great Neck, N.Y. 11020
Filed Feb. 28, 1973, Ser. No. 336,497
Int. Cl. B63c *9/06*
U.S. Cl. 9—3 **2 Claims**

A one man life raft capable of being launched by a single person, requiring no inflation, and providing maximum protection against the elements. The raft comprises a molded hull of polyethylene or similar synthetic resinous material and is of generally circular or disk-like configuration defining a main compartment or cockpit having a closable hatch to completely seal the same with an occupant disposed inside. Snorkel means provides fresh air in the absence of water intake. Ad-

jacent the main compartment are a pair of non-communicating flotation tanks capable of keeping the device afloat should the main compartment be flooded. An adjustable backrest supports the occupant in a semi-reclining position when the



cover is closed, and allows a sitting position with the head of the occupant projecting out of the main compartment in good weather. The device is approximately four feet in diameter and two feet in height, and is configured to permit the stacking of a plurality of such devices.

3,813,718

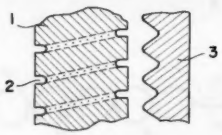
METHOD OF MANUFACTURING ROLL THREADED SCREWS HAVING ELASTICITY

Minoru Kamiya, 2-46-3 Minami-Otsuka, Tokyo, Japan

Filed May 24, 1973, Ser. No. 363,597

Int. Cl. B21h *3/06;* **B23g** *7/00*

U.S. Cl. 10—10 R **3 Claims**



A method of manufacturing roll threaded screws having elasticity by forming a helical groove in a screw workpiece in conformity to the pitch or lead of the screw to be produced, and then urging a thread rolling die against the workpiece on said helical groove or on the workpiece body other than said helical groove and moving the die relative to the workpiece, thereby forming a closed helical space in the top or root of the thread.

3,813,719

METHOD OF MAKING SHOES

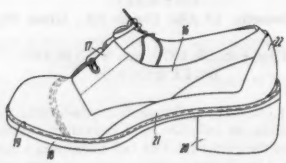
Paul Kaschura, Hardegsen, Germany, assignor to Alfred Malich GmbH Firma, Sudheim, Germany

Filed July 10, 1972, Ser. No. 270,517

Claims priority, application Germany, Apr. 28, 1972, 2220983

Int. Cl. A43d *9/00*

U.S. Cl. 12—142 RS **4 Claims**



A shoe having an upper which completely envelops a human foot like a sock. The last, the blank is drawn upon, is shaped like a natural foot. The bottom part of the shoe comprises at least the outer sole, heel cap and supporting elements in one integral part and is indissolubly bound to the upper by omission of an insole. The blank forming the upper is held together by outwardly pointing seams. The bottom part of the shoe is a plastic composition that is connected with the upper. The inner sole of the shoe is rounded to conform the natural shape of the foot enclosing the foot like a sock.

3,813,720

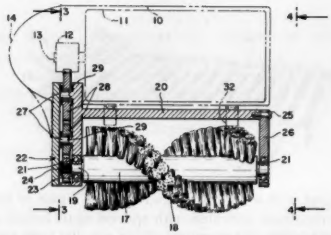
POWER-DRIVEN ROTARY BRUSH

F. Arthur Sylvie, East Elmhurst, N.Y., assignor to Arthur J. Sylvie, Jamaica, N.Y.

Continuation-in-part of Ser. No. 192,125, Oct. 26, 1971, abandoned. This application Dec. 4, 1972, Ser. No. 312,072

Int. Cl. A46b *13/02*

U.S. Cl. 15—23 **9 Claims**



A portable, hand held, power driven machine having two rotary brushes detachably mounted on a housing in which a reversible electric motor is disposed. The brushes are driven by a gearing system disposed in a mounting member on which they are arrayed. The bristles of the brushes are arranged in either spiral or linear rows and intermesh for efficiency and compactness. Flexible mounting clips detachably secure the mounting member to the housing.

3,813,721

WATER HOSE, ROTARY BRUSH ATTACHMENT

Domenico Gaudio, Pittsburgh, Pa., assignor to Anna Gaudio; Thelma Gaudio; Vincent Gaudio and Nina Schultz, Pittsburgh, Pa., a part interest to each

Filed Sept. 20, 1972, Ser. No. 290,478

Int. Cl. A46b *13/06*

U.S. Cl. 15—29 **5 Claims**

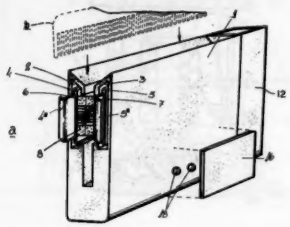
A water hose attachment including a propeller actuated by a stream of water enclosed in a housing and to which propeller a brush is attached and thereby driven and rotated so as to more effectively wash and brush automobiles and the like.

3,813,722

HAIR-COMB CLEANING DEVICE

Leon Sapochinik, Ar. Roques S. Penta Pis 07, Buenos Aires, Argentina

Filed Dec. 1, 1972, Ser. No. 311,258
Int. Cl. A45d 24/44; A61l 7/00
U.S. Cl. 15—104.92 4 Claims



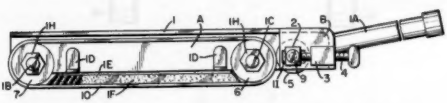
A hair-comb cleaning device has a U-shaped body which can be fixed to and removed from a wall surface and which has internal longitudinal channels for removable members which carry upper and lower spongy strips and centrally located bristle tufts, the strips of one member being juxtaposed to those of the other member, and the bristle tufts of both being interlaced. The lower spongy strips communicate with a refillable receptacle containing an antiseptic liquid and joined to one end of the U-shaped body.

3,813,723

LIQUID ABSORBING DEVICE HAVING AN ENDLESS TOWEL BELT

Frederick Lonnie Jerry, 10234 Dexter Ave., Detroit, Mich. 48206

Filed Aug. 25, 1972, Ser. No. 283,779
Int. Cl. A47l 13/144
U.S. Cl. 15—119 R 2 Claims



A manually driven drying device having an endless towel belt trained over spaced parallel rollers and an adjustable roller moveable into engagement with the belt for wringing liquid from the same.

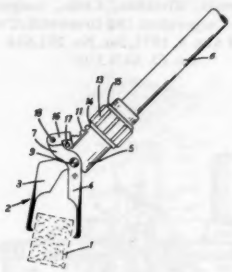
3,813,724

HOLDER FOR REPLACEABLE CLEANING ELEMENT

Henry M. Unger, Walter-Dodde-Str. 16 P.O. Box 100102, 565 Solingen, Germany

Filed Aug. 16, 1972, Ser. No. 281,155
Claims priority, application Germany, Oct. 25, 1971, 7140343
Int. Cl. A47l 13/24, 13/46
U.S. Cl. 15—150 3 Claims

A cleaning device comprises a holder for a replaceable cleaning element, and a handle. The holder is composed of a stationary clamping jaw and an adjustable clamping jaw pivoted to each other. The stationary clamping jaw is provided with a neck-like extension for insertion of the handle. A rack provided with thread-type teeth is movable on the neck-like extension along the longitudinal axis thereof. The adjustable clamping jaw of the holder is hingedly connected to the rack,



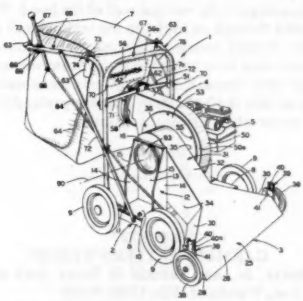
while a nut provided on the neck-like extension and prevented from axial displacement engages the teeth of the rack.

3,813,725

VACUUM CLEANER CONSTRUCTION

Carl G. Rinker, Atwater, Ohio, assignor to Atwater Strong Co., Inc., Atwater, Portage, Ohio

Filed Aug. 17, 1972, Ser. No. 281,293
Int. Cl. A47l 9/10
U.S. Cl. 15—347 10 Claims



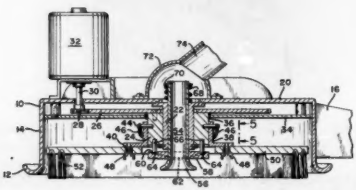
A vacuum cleaner having a longitudinally extending nozzle pivotally mounted on a movable carriage. An annular fan housing is mounted on the carriage containing a fan driven by an engine for developing an air flow through the nozzle and fan housing. A tangentially-disposed fan housing discharge or exhaust port communicates with a bag which is suspended from a handle mounted on the rear of the carriage to receive and store debris collected by the nozzle. The engine is mounted on the carriage at one side of the fan housing and the engine shaft extends laterally of the carriage into the fan housing, and the fan is mounted on the shaft within the housing. The exhaust end of the nozzle is pivotally mounted on a vertical carriage bracket and on the other side of the fan housing for limited pivotal movement vertically about a laterally extending axis. The front or inlet end of the nozzle is roller supported by a pair of wheels. A roller is pivotally mounted on the front end of the carriage beneath the nozzle and is actuated by a lever mounted on the handle for controlling the vertical position of the nozzle inlet end and opening with respect to a surface being cleaned. A self-propelling driving mechanism engageable with the rear carriage wheels may be incorporated in the cleaner construction.

3,813,726

VACUUM CLEANER SUCTION TOOL WITH PILE AGITATOR ROTATABLE IN A HORIZONTAL PLANE FOR CLEANING DEEP PILE SHAG RUGS

John J. Kowalewski, Riverside, Conn., assignor to Consolidated Foods Corporation, Old Greenwich, Conn.

Filed Aug. 4, 1972, Ser. No. 252,614
Int. Cl. A47l *5/10*
U.S. Cl. 15—385 **4 Claims**



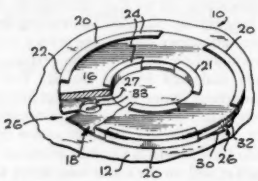
In accordance with the present invention there is provided a suction cleaning tool having a hood member open at the bottom and adapted to rest on the surface of a shag rug. One or more surface agitator members are mounted for rotation in a horizontal plane within the hood and means are provided for exhausting a large volume of air from the interior of the hood. Air may be admitted both under the edge of the hood bounding the open bottom and through preferably tangentially directed openings in the vertical wall of the hood. The air may be exhausted through an outlet in the vertical wall or through a centrally located nozzle extending through the top wall, which nozzle may be arranged to reciprocate vertically. A still greater air flow through the hood may be obtained by introducing air into the hood from a blower preferably driven by the same motor which drives the agitators.

3,813,727

GARMENT PATTERN WEIGHT

John J. Borer, Jr., and Patricia O. Borer, both of 6014 El Canon Ave., Woodland Hills, Calif. 91364

Filed Jan. 15, 1973, Ser. No. 323,975
Int. Cl. A47g
U.S. Cl. 16—1 **4 Claims**



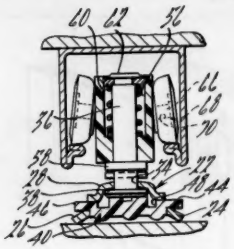
This is a weight for firmly and demountably positioning one sheet member, such as a pattern or other reference shape, in contact with a second sheet member, such as cloth or other material, to be formed like the reference shape. The weight includes easily positioned, removable gripping supports.

3,813,728

DOOR HANGERS

Leonard E. Johnson, 7 Susquehanna Rd., Elkhart, Ind. 46514

Filed Sept. 11, 1972, Ser. No. 287,894
Int. Cl. A47h *15/00*
U.S. Cl. 16—97 **2 Claims**



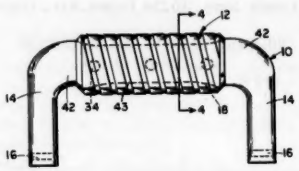
A door hanger for suspending folding doors from an overhead track having a resiliently mounted roller carrier reciprocably disposed on a stem which is removably mounted on a door plate and which is latched in place by a sliding latch.

3,813,729

RIGID SUBSTANTIALLY U-SHAPED HANDLE WITH CLOSED-CELL FOAM HANDGRIP

Marton Szabo, 1440 Sheridan St., Apt. G-5, Camden, N.J. 08104, and George W. Bush, 319 Graisbury Ave., Haddonfield, N.J. 08033

Filed Jan. 4, 1973, Ser. No. 320,942
Int. Cl. A45c *13/26*
U.S. Cl. 16—119 **3 Claims**



A soft-feel handle for attachment to an appliance, luggage, carrying case and the like comprised of a solid, rigid, substantially U-shaped member having arms joined by a web or core, a softer resilient material preferably closed-cell foam coextensive with the web, and non-mechanical means securing the softer resilient material to or around the web so that there is no relative movement between the softer resilient material and the rigid material and a method of making the handle.

3,813,730

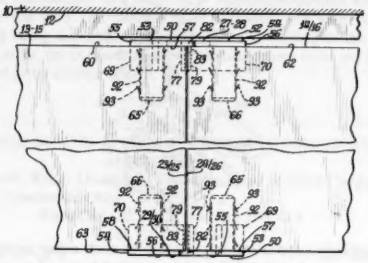
HINGES FOR USE ON FOLDING DOORS AND THE LIKE

Lester L. Smith, 5151 Mission Hills Dr., Tucson, Ariz. 85718

Filed Feb. 23, 1973, Ser. No. 335,231
Int. Cl. E05d *5/02*
U.S. Cl. 16—135 **14 Claims**

A hinge adapted to low cost production and suited to use in connecting planar panels of folding doors and the like together for swinging movements relative to one another and to and from coplanar relationship, said hinges having plug-type mounting portions insertable into, and securable in precisely located openings that may be jig-bored or prefabricated in the panels prior to installation, thereby to minimize both product and installation cost and to effect

proper positioning and alignment of the hinge axes. The hinge is also reversible and interchangeable for use at both top and



bottom positions on the door panels, thus to limit inventory of parts and reduce possibilities of errors in assembly or placement.

3,813,731

FINELY PERFORATED ARTIFICAL GAS AND WATER VAPOR PERVIOUS WRAPPING FOR FOODSTUFFS

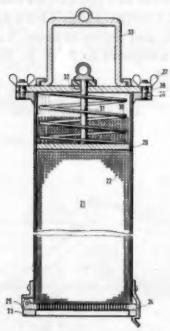
Heinz Becker, Hamburg-Blankenese, and Karl-Heinz Steigerwald, Munich, both of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Germany, by said Steigerwald

Filed Dec. 21, 1970, Ser. No. 99,918

Claims priority, application Germany, Dec. 19, 1969, 1963798

Int. Cl. A22c *7/00*

U.S. Cl. 17—34 **1 Claim**



The artificial wrapping for foodstuffs comprises perforations produced by energy beams, e.g., electron beams. These perforations can be made very precisely yet extremely fine in a great variety of materials, e.g., plastic, metal, glass, ceramic, or glass-ceramic.

3,813,732

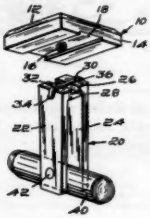
DETACHABLE, CONVERTIBLE CUFF LINK

Burton W. Seavey, 3 Harris Rd., Lynn, Mass. 01904

Filed June 11, 1971, Ser. No. 152,198

Int. Cl. A41b *7/02*

U.S. Cl. 24—41 **2 Claims**



A cuff link device has a linking member having an inner end member and a resilient clamp attached to the latter. A head may be removably connected to said linking member by means of a connector ring that receives said clamp and which is drawn between the inner end member and said clamp.

3,813,733

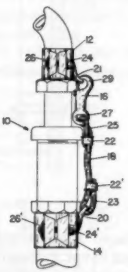
SAFETY CABLE AND BAND

Ira Karl Flohr, Rt. 1, Box 2A, Ridgway, Colo. 81432

Filed Feb. 16, 1973, Ser. No. 332,994

Int. Cl. A44b *21/00*; **B65d** *63/06*; **F16l** *35/00*

U.S. Cl. 24—81 A **3 Claims**



A safety cable clamp for securing hose ends to an adjoining metal coupling sleeve, such as that found on a variety of machinery where high pressure air or water is pumped through a hose, comprising cylindrical bands which fit over and are secured over the hose ends at opposite sides of the hose coupling, with the bands conjoined by a braided flexible cable with closed end eyelets, one end of the cable interconnecting directly with a band, and the other end secured to a snap hook which connects the remaining band.

3,813,734

BUCKLE

George H. Schauweker, Southbridge, and Harry Dostourian, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

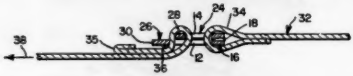
Filed Nov. 3, 1972, Ser. No. 303,444

Int. Cl. A44b *11/02*

U.S. Cl. 24—200 **3 Claims**

A self-locking buckle for straps, belts, bands or ties formed of a one-piece unit having two sections, one folded over the other to form a first strap connection at the juncture of folding and a second adjustable strap connection adjacent cor-

responding free ends of the folded unit. The latter connection is adapted to receive one end of a strap threaded over one free end of the unit and beneath the other free end reversely upon

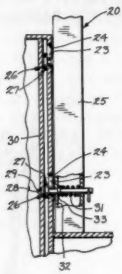


itself for longitudinal sliding adjustment of its effective length relative to the buckle and automatic locking at preselected positions of the adjustment.

3,813,735
SNAP-ON ATTACHMENT FOR UTILITY SERVICE TRAILERS AND THE LIKE

William E. Thiermann, 10726 N. Wauwatosa Rd., Mequon, Wis. 53092

Continuation-in-part of Ser. No. 131,115, April 5, 1971, Pat. No. 3,734,590. This application July 3, 1972, Ser. No. 268,719
Int. Cl. F16b *19/00*
U.S. Cl. 24—201 SL **2 Claims**



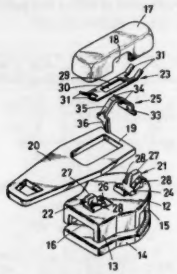
A plurality of spaced keyhole slots facing in the same direction are provided in one member, and the other member to be attached thereto is provided with correspondingly spaced and positioned headed projections adapted to be received through the larger portion of the slots and to interlock with said first member upon relative shifting between the members in a direction moving the headed projections into the smaller portions of the slots. A spring biased interlock retains the members against dislodgement of the projections from the slots until released.

3,813,736
AUTOMATICALLY LOCKING SLIDER FOR ZIP FASTENER

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1972, Ser. No. 226,062
Claims priority, application Japan, Feb. 15, 1971, 46-6364
Int. Cl. A44b *19/30*
U.S. Cl. 24—205.14 R **6 Claims**

A slider for zip fastener is provided with means for automatically locking the slider in position on the zip fastener, said means comprising a locking member and a spring member operatively associated therewith. These two members are held

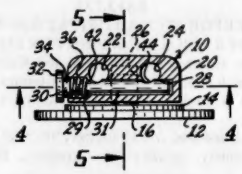


in mutually supporting relationship to each other so that the locking member can follow a controlled locus of movement during its locking operation.

3,813,737
CLASP FOR BOLA TIE WITH INTERCHANGEABLE MOUNT

Ernest F. Larsen, Mesa, Ariz., assignor to The King of All, Inc., Eager, Ariz.

Filed July 2, 1971, Ser. No. 159,188
Int. Cl. A41d *25/04, 25/10*
U.S. Cl. 24—49 S **8 Claims**

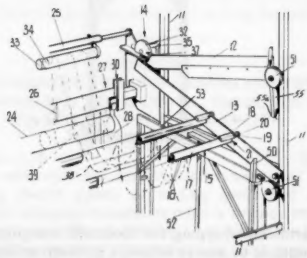


Bola tie clasp apparatus is disclosed which holds the braids of a bola tie and a removable mount for the bola tie.

3,813,738
METHOD AND APPARATUS FOR REMOVING CONNECTING THREADS

Roy Beet Hucknall, and Barry Skinner, both of Sutton-in-Ashfield, England, assignors to S. & E. Strauss Limited, Nottingham, England

Filed Sept. 11, 1972, Ser. No. 287,784
Int. Cl. D02g *3/00*
U.S. Cl. 28—1 CS **10 Claims**



A method for removing connecting threads from multiple strip lace comprising supporting the lace at a plurality of posi-

tions along the length of the lace os as to suspend the lace in festoons and drawing the connecting threads away from the lace. The invention also includes apparatus for carrying out the method having means for feeding the lace from a roll over an engaging edge which is intermittently raisable to present the lace individually to a plurality of suspension devices which engage the lace and support it in festoons, the suspension devices being movable in synchronism with raising of the engaging edge, the connecting threads being drawn from the lace by hand or by a rotating grip.

3,813,739

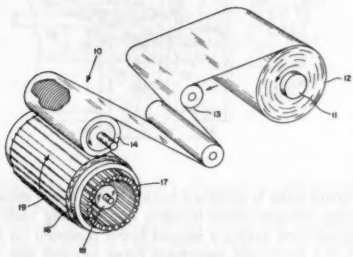
METHOD OF AND APPARATUS FOR MAKING HOLLOW 3-D MATERIAL

Robert W. King, Lexington, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Filed Oct. 20, 1972, Ser. No. 299,414

Int. Cl. B21h *1/14*

U.S. Cl. 28—1 R **12 Claims**



The invention relates to 3-D material where layers of fabric are pierced and reinforcement is inserted in the passages thus formed. Generally, the invention relates to a method and means for providing reinforcement in the third dimension. In this instance, layers of fabric are wound on a roll. As each layer is wound, it is pierced by a plurality of needles. When the specified number of layers are deposited, the needles are withdrawn and replaced by reinforcement.

3,813,740

TOW GUIDE FOR STUFFER BOX CRIMPING

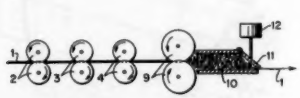
James W. IJ. Heijnis, Arnhem, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Mar. 22, 1971, Ser. No. 126,482

Claims priority, application Netherlands, Mar. 25, 1970, 7004249

Int. Cl. D02g *1/12*

U.S. Cl. 28—1.6 **4 Claims**



Method and apparatus are disclosed for stuffer crimping a filament or fiber tow of at least 5,000 total denier. The tow is fed between the teeth of at least one pair of meshing gear wheels, the teeth of the gear wheels applying simultaneous transverse forces to the tow.

3,813,741

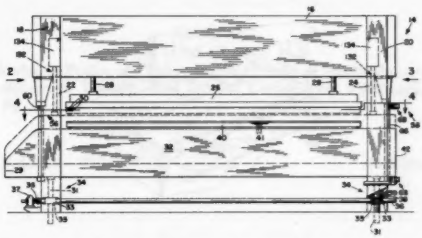
BED BEAM GUIDE FOR NEEDLE PUNCHING MACHINE

Raymond E. Brochetti, Westfield, Mass., assignor to James Hunter Machine Company, Inc., North Adams, Mass.

Filed Mar. 9, 1973, Ser. No. 339,799

Int. Cl. D04h *18/00*

U.S. Cl. 28—4 R **10 Claims**



Means for vertically guiding a removable bed beam in a needle punching machine, the guiding means including a first guide means for preventing horizontal movement of one end of said bed beam in a direction to the longitudinal axis of the bed beam and a second guide means convertible to two positions, an active position for preventing horizontal movement of the opposite end of said bed beam in any direction and an inactive position for allowing the bed beam to be moved horizontally along its longitudinal axis.

3,813,742

WARP END TYING MACHINE

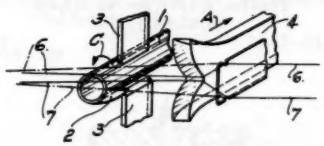
Hans Bar, Augsburg, Germany, assignor to Knatex Maschinenbau, GmbH, Augsburg, Germany

Filed Aug. 17, 1972, Ser. No. 281,490

Claims priority, application Germany, Aug. 23, 1971, 2142175

Int. Cl. D03j *1/18*

U.S. Cl. 28—49 **6 Claims**



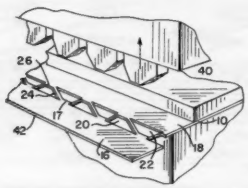
Warp end tying machine for tying together the threads of two warp thread groups. There is provided a device for tying together the ends of two groups of warp threads which comprises essentially a tying hook, a cutting device, and a reciprocable suction tube having a jaw-shaped mouth. The tying hook comprises a radial projection on a rotatable tube, said tube being hollow and connected to a source of suction. The suction tube functions both as holding means for the threads to be tied and as disposal means for disposing of the cut ends thereof. The suction tube first receives the threads and holds same in a first position with respect to the tying hook, such that the hook in rotating about its axis will form the thread into a loop. After such rotation is completed, the suction tube holder moves parallel with the axis of the tying hook to bring a portion of the threads ahead of the loop made by rotation of the hook. A cutter then cuts said threads close to the hook and suction within the hook draws said end inwardly and through such loop. The knot may now be drawn tight and same is completed.

3,813,743

METHOD OF EXPANDING METAL

Bob G. Harrell; Peter J. Wenta, and Russell J. Linsin, all of St. Louis, Mo., assignors to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed July 14, 1972, Ser. No. 271,715
Int. Cl. B21d 31/04
U.S. Cl. 29—6.2 10 Claims



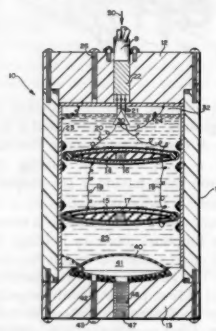
A method of expanding a sheet of metal to produce a solid border portion at opposite ends of an expanded mesh portion including first forming a series of slits in the metal sheet at first selected points transverse thereto and disposed inward from a leading end thereof to produce a row of slits; then, shearing the metal sheet at a second series of points transverse to the sheet, each of these points being laterally and longitudinally spaced from a corresponding one of the slits, and, simultaneously expanding the sheet at the second points of shear to form a plurality of mesh openings; and, finally, continuing this simultaneous shearing and expanding for a desired distance along the metal sheet to form an expanded portion. An article of manufacture produced according to the first step of the above method having a series of slits formed in a metal sheet inward from an end thereof and at selected points transverse thereto by vertically shearing the sheet at these points, the sheet being separated into different planes on opposite sides of the slits by the force of the shear.

3,813,744

GEOPHONE TREATMENT

Harold B. Morris, Houston, Tex., assignor to Seismic Logs, Inc., Houston, Tex.

Filed Dec. 8, 1972, Ser. No. 313,496
Int. Cl. B01j 17/00
U.S. Cl. 29—25.35 18 Claims



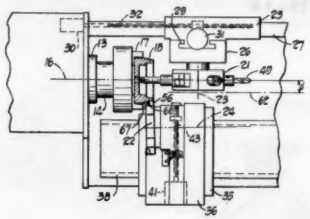
Disclosed is a method of manufacturing a motion sensitive detector of the type having a receptacle with a cylindrical chamber, a transducer, and an inflated envelope. In the method the receptacle is first filled by weight with an acoustic transmission compound and thereafter the transducer and inflated envelope are mounted in the receptacle. The receptacle is vented to the atmosphere and centrifuged to degas the acoustic transmission compound. Next, air is evacuated from the top of the receptacle and the receptacle is sealed. The inflated envelope is then evacuated and the centrifuge process repeated with the receptacle sealed to form a void in the top of the receptacle about 0.1 to 0.2 inches high.

3,813,745

DUAL TURRET LATHE

Kermit T. Kuck, and Nagle V. Gushing, both of Sidney, Ohio, assignors to The Monarch Machine Tool Company, Sidney, Ohio

Filed Sept. 16, 1971, Ser. No. 180,969
Int. Cl. B23b 3/18
U.S. Cl. 29—36 10 Claims



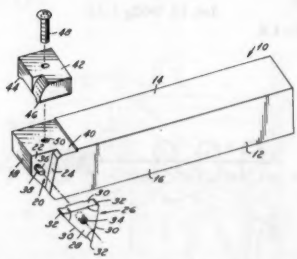
A turret lathe is disclosed having a first turret mounted on generally vertical slides to carry end working tools for the workpiece and having a second turret mounted on separate slides in a horizontal movement plane to carry side working tools. The envelopes of movement of the turrets do not interfere with each other permitting simultaneous cutting by tools in each of the two turrets. Numerical control is employed on both turrets for control of speed, feed and tool selection with full contouring and thread cutting capabilities. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,813,746

TOOL HOLDER

Philip A. Price, Franklin, Mich., assignor to Joseph C. Jordan, Howell, Mich., a part interest

Filed Mar. 5, 1973, Ser. No. 337,911
Int. Cl. B26d 1/02
U.S. Cl. 29—96 6 Claims



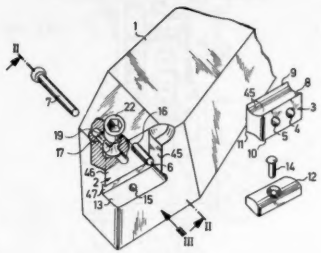
A tool holder having a triangularly shaped cutting tool insert indexably mounted thereon. The support structure for the insert includes a recess in the tool holder having a wall

inclined at an angle of 60° to the forward top face portion of the holder against which one of the three end faces of the insert is seated and a slightly undersize pin in the recess engaging the central opening through the insert with a clamping block on the forward top face portion of the holder forcing the insert downwardly against the pin and inclined face.

3,813,747
CUTTING TOOL

Karl Hertel, Oedenberger Str. 29, D-8500 Nuernberg, Germany

Filed Dec. 15, 1972, Ser. No. 315,312
Claims priority, application Germany, Dec. 23, 1971, 2164093
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **15 Claims**



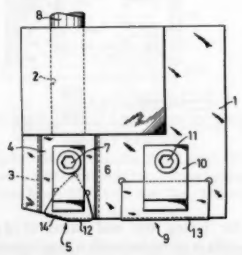
A cutting tool for a machine tool such as a lathe including a tool holder having a recess formed therein, in which is positioned a cutting body provided with at least one aperture. Engaged in the aperture is a pin, which is fitted in an associated bore in the tool holder, the pin being biassed laterally to hold the cutting body against the base of the recess. The bore is of slot-like cross-section, at its end near the recess, so as to give unilateral loose play for the pin in one radial direction only, in a direction to clamp the cutting body against the base of the recess. Preferably the major axes of the slot-like cross-section of the bores, where two or more are provided, are at an angle to one another.

The biassing means may be in the form of a fixing screw or anchor passes between two pins and is provided with a lateral recess or groove in which the pins are engaged.

3,813,748
PRE-TURNING MACHINE FOR WIRE OR ROD STOCK

Wolfgang Lindemann, Aachen, Germany, assignor to Orbit Beratungsgesellschaft GmbH, Aachen, Germany

Filed Sept. 11, 1972, Ser. No. 287,711
Claims priority, application Germany, Oct. 18, 1971, 2151804
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 R **3 Claims**

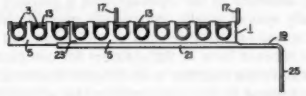


A pre-turning machine with a rotatingly driveable cutting head for pre-turning wire or rod stock is disclosed having radially adjustable cutting blades and having arranged behind the cutting blades in the direction of advance at least one blade for smoothing the outer surfaces of the pre-turned stock. This smoothing blade is firmly arranged on the cutting head and is provided with a straight cutting edge.

3,813,749
A TUBE CLAMP

Charles C. Peake, and Harry H. Bolan, both of Media, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 13, 1972, Ser. No. 306,132
Int. Cl. B23p *15/26*
U.S. Cl. 29—202 R **4 Claims**

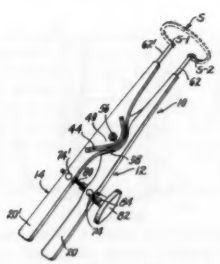


An elongated strip of stainless steel having a plurality of equally spaced oblong holes transversely disposed therein is bent along its longitudinal axis to have a V-shaped cross section, whereby the oblong openings form kerfs, which register with and accept a tube. The kerfs are disposed over the tubes to be clamped and a pin is inserted between the tube and the bent portion of the strip, securely clamping the tubes against the pin.

3,813,750
IMPLEMENT FOR MANIPULATION OF SNAP RINGS

Robert M. Kerr, P.O. Box 1135, Winter Garden, Fla. 32787

Filed Sept. 19, 1972, Ser. No. 290,314
Int. Cl. B23p *10/04*
U.S. Cl. 29—229 **1 Claim**

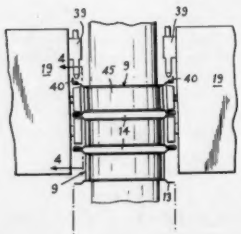


A plier like tool for removal and replacement of snap rings such as the type which are frictionally or otherwise engaged about a bearing race or the like. The tool has pivotally related body members with an interconnecting adjustment rod located aft of an intermediate offset pivot. Pins are extended from the leading end of the tool for engagement with the ring.

3,813,751
HYDRAULIC CHUCK
George R. Smida, 6912 Lombardy Ln., Minneapolis, Minn. 55428
Filed Nov. 22, 1972, Ser. No. 308,736
Int. Cl. B23p *15/26, 19/04*
U.S. Cl. 29—202 D 9 Claims

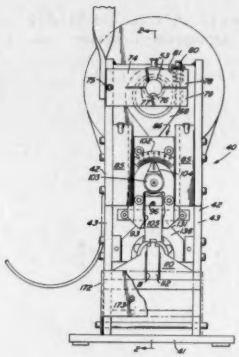
An hydraulic chuck including a cylinder having an opening at the inner end thereof, a cap with a tapered bore mounted on the outer end of the cylinder, a piston having a bore and slidably mounted in the cylinder with a plurality of circumferentially spaced axially and radially movable tube-gripping jaws mounted on the outer end of the piston and engageably with the tapered bore of the cylinder for compression of the jaws upon a tube together with the piston having an annular receiver formed in the outer end for the reception of a tube therein and sealing means carried internally of the piston at said receiver means for engagement with the outer surface of a tube to be expanded.

3,813,752
APPARATUS FOR MANUFACTURING HEAT EXCHANGERS
Colin Raymond Bemrose; William Arthur Hall, and Eirug Ellis Williams, all of Leamington Spa, England, assignors to Associated Engineering Limited, Leamington Spa, England
Division of Ser. No. 179,958, Sept. 13, 1971, abandoned. This application May 30, 1973, Ser. No. 365,285
Claims priority, application Great Britain, Sept. 25, 1970, 45906/70
Int. Cl. B23p *15/16*
U.S. Cl. 29—202 D 9 Claims



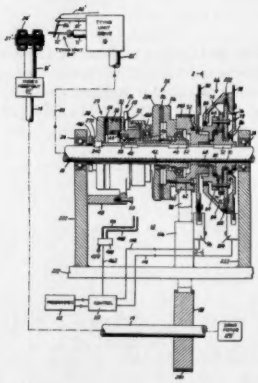
An apparatus for manufacturing heat exchangers wherein means are provided for locating an element comprising a corrugated metal strip bonded between two sheet-like metal members on top of a similar element and forming seams between adjacent ones of the sheet-like members of the adjacent elements.

3,813,753
APPARATUS FOR APPLYING TERMINALS FROM A CARRIER STRIP TO WIRE
James E. Miller, Westville, N.J., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Nov. 22, 1972, Ser. No. 308,689
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 DT 4 Claims



Apparatus mounting crimping dies and feeding means for crimping successively fed terminals and dislodging the crimped terminals from a feeding carrier, by synchronized relative movement between the crimping dies and carrier feeding means.

3,813,754
APPARATUS FOR TYING COILS
Harold T. Fields, Fort Wayne, and Richard J. Habegger, Grabill, both of Ind., assignors to General Electric Company, Fort Wayne, Ind.
Filed Feb. 20, 1973, Ser. No. 333,495
Int. Cl. H05k *13/00*; H02k *15/00*
U.S. Cl. 29—203 D 19 Claims



Apparatus for lacing the end turns of dynamoelectric machine field coils is provided with a mechanism for skipping a predetermined number of stitches. The stitch-skipping mechanism includes a clutch-brake for selectively coupling the stitching apparatus drive shaft to the stator core indexing

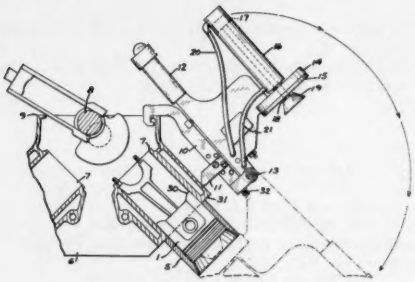
drive shaft and a control system which compensates for shaft alignment errors caused by non-instantaneous response and action of the clutch-brake thereby to assure the existence of a desired angular relationship between the two shafts.

3,813,755

DEVICE FOR PNEUMATICALLY LOADING PISTON ASSEMBLIES INTO ENGINE BLOCK CYLINDER BORES

John S. Maskell, Muskegon, and Roger D. Dykehouse, Spring Lake, both of Mich., assignors to Sealed Power Corporation, Muskegon, Mich.

Filed Jan. 5, 1973, Ser. No. 321,277
Int. Cl. B23p *19/04*
U.S. Cl. 29—252 **11 Claims**



A device for pneumatically loading piston assemblies into engine block cylinder bores. A pneumatic piston loading tool is supported on the engine block by means of a hook hung on the lower pan rail and rests against the side of the engine block. The piston assembly is loaded into a loading sleeve and the projecting end of the piston inserted into the engine cylinder bore with the sleeve against the face of the block. The loading tool is placed in the loading position. A given force is applied to the handle of the loading tool forcing the sleeve firmly against the block. When sufficient force is applied on the handle of the loading tool a microswitch is closed and this actuates a solenoid controlled four-way pneumatic flow control valve to admit pneumatic pressure into a cylinder which actuates a plunger. As the plunger moves outwardly it drives the piston assembly with a controlled force into the cylinder bore. When the pressure or force applied to the handle is released, the flow control valve reverses and causes the plunger to be withdrawn from the cylinder bore.

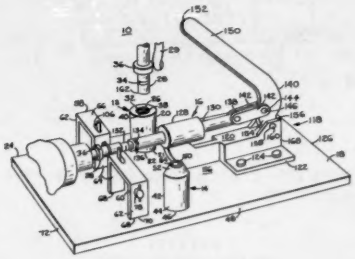
3,813,756

METHOD OF REMOVING AND REPLACING SPLIT RING SHAFT LOCKS

Thayer B. Rigsby, 3405 Camelia Pl., Largo, Fla. 33540, and Burl K. Rigsby, 110 Stillwood Dr., Manchester, Tenn. 37355

Filed Mar. 20, 1972, Ser. No. 236,128
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 **1 Claim**

The method and apparatus for the removal and installation of split ring type shaft locks wherein, one, a tubular die is employed to receive a shaft and enable the separation of the collar portion of the shaft lock from the split ring portion, two, a die and press assembly is employed to remove the split ring from the shaft, three, the split ring is reinstalled by placing the split ring in the tubular die and pressing on the shaft, and four,



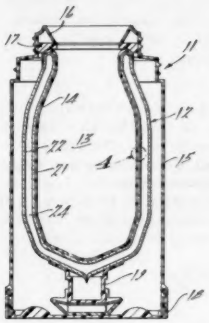
a second tubular die is employed which receives the now-in-place split ring and enables the collar to be placed over it by applying pressure to the collar.

3,813,757

METHOD OF COATING A VACUUM BOTTLE

Vernon D. Bell, Westerly, R.I., assignor to King-Seeley Thermos Co., Norwich, Conn.

Filed Sept. 1, 1971, Ser. No. 176,975
Int. Cl. B44d *1/094*; **A47j** *41/02*
U.S. Cl. 29—455 **4 Claims**



A vacuum bottle having a plastic coated or lined vacuum filler unit and method of lining such a vacuum filler. In connection with the method of lining the filler, before the filler is evacuated it is heated and a granular or powdered thermoplastic material is placed on the surface that is to be lined. The filler is then evacuated and sealed so that its heated walls will retain the heat sufficiently to insure good fusion of the plastic coating.

3,813,758

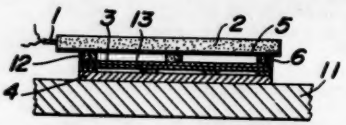
EXPLOSIVE WELDING PROCESS

Masatada Araki, Chita-gun, Japan, assignor to Nippon Oils and Fats Company Limited and Showa Senko Kabushiki Kaisha

Filed Dec. 14, 1971, Ser. No. 207,873
Claims priority, application Japan, Dec. 15, 1970, 45/111179; Dec. 15, 1970, 45/111180
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **14 Claims**

An explosive welding process for bonding at least one cladding metal sheet to a base metal sheet, by driving one of

the two metallic sheets toward the other by the collision impact of a driver plate to said one sheet. The collision of the



driver plate is actuated by the detonation of an explosive layer disposed on its surface.

3,813,759

METHOD OF BRAZING

Harry Rodney Heap, and Colin Charles Riley, both of Stafford, England, assignors to English Electric Company Limited, London, England

Filed Sept. 9, 1971, Ser. No. 179,192

Int. Cl. B23k *31/02*

U.S. Cl. 29—472.7 **13 Claims**

A method of brazing together bodies composed either of dense self-bonded silicon carbide containing free silicon or dense carbon using a brazing material consisting of an alloy of silicon with one or more metals, in particular germanium, iron, gold, nickel, palladium, platinum, chromium, titanium, which alloy contains at least 5 atomic per cent of silicon, has a melting temperature not higher than 1400°C, has thermal expansion characteristics matching those of the bodies to be brazed together, and in the molten state is capable of wetting the surfaces of the bodies. The method is especially suitable for bracing silicon carbide caps to silicon carbide nuclear fuel element containers.

3,813,760

PROCESS FOR MAKING RAILS RESISTANT TO WEAR AND TEAR

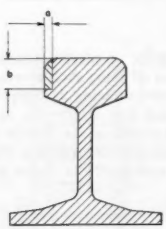
Gerhard Arndt, Essen, Germany, assignor to Electro-Thermit GmbH, Essen, Germany

Filed Dec. 1, 1972, Ser. No. 311,114

Claims priority, application Germany, Dec. 14, 1971, 21619658

Int. Cl. B23p *17/04*

U.S. Cl. 29—527.4 **9 Claims**



A process for producing rails with a lateral guide surface, together with or without an inner or running edge, and/or a bearing or running surface which is highly resistant to wear and tear, which comprises

a. preparing the lateral guide surface, with or without an inner or running edge, and/or bearing surface by the formation of a substantially rectangular recess therein, whereby

a1. in the case of the preparation of the lateral guide surface together with an inner or running edge, the rectangular recess has a height of at least 10 mm and maximally 34 mm, and a width of at least 3 mm and maximally 10 mm, and

a2. in the case of the preparation of the running or bearing surface, at least one recess positioned essentially parallel to the longitudinal rail axis has a height of at least 3 mm and maximally 8 mm, and a width of at least 10 mm and maximally 30 mm,

b. filling the recesses by welding on a welding material having the following composition (in percent):

C x 0.45 to 0.65

Si x 0.30 to 0.50

Ni x 3.00 to 4.00

Mn x 13.00 to 16.00

remainder Fe and impurities resulting from the manufacturing process, and

c. treating the welded-on material for the purpose of exactly reestablishing the profile of the rail.

3,813,761

SEMICONDUCTOR DEVICES

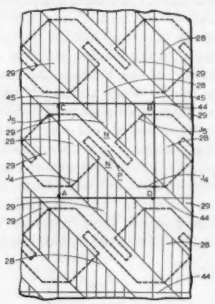
Alan Foster, Stockport, England, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 29, 1972, Ser. No. 230,265

Claims priority, application Great Britain, Mar. 1, 1971, 5712/71

Int. Cl. B01j *17/00*

U.S. Cl. 29—583 **12 Claims**



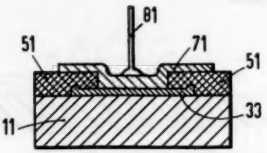
Method of producing semiconductor devices, comprising providing semiconductor body with a first major surface comprising mutually adjoining surface portions of substantially rectangular configuration; providing different conductivity type regions at various surface portions; providing metal electrode strips at the first major surface, the strips being substantially parallel to imaginary lines diagonally extending across respective surface portions, with strip portions interconnecting a number of the conductivity regions; and then dividing the semiconductor body along the orthogonal boundaries of the surface portions to produce the devices.

3,813,762

METHOD OF PRODUCING SCHOTTKY CONTACTS

Hermann Kniepkamp, Muenchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 24, 1971, Ser. No. 201,886
Claims priority, application Germany, Nov. 27, 1970, 2058554
Int. Cl. H01l 7/00, 7/50
U.S. Cl. 29—589 20 Claims



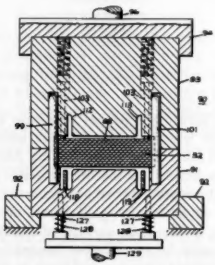
Method of producing metal-semiconductor contacts (Schottky contacts) with precisely defined and relatively small surface areas comprising: applying a layer of an insulating material (aluminum oxide or silicon dioxide) onto a semiconductor surface; etching only areas of the insulating material layer corresponding to the desired contact; coating a layer of chromium onto the exposed semiconductor surface areas and on the non-etched insulating material areas and etching only the areas comprised of a top layer of chromium and a bottom layer of insulating material to produce discrete areas of chromium directly on the semiconductor surface. In one embodiment, the so-formed semiconductor having discrete areas of chromium thereon is further treated by coating another layer of an insulating material over the chromium areas and the semiconductor surface areas, etching only the areas of the insulating material layer generally corresponding to the chromium layer areas and applying a layer of aluminum onto the exposed chromium areas for attachment of feed-line or the like directly onto said aluminum layer.

3,813,763

LAMINATED STRUCTURE WITH INSULATING MEMBER FORMED IN SITU THEREON AND METHOD FOR MAKING SAME

Ralph E. Church, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 99,049, Dec. 17, 1970, Pat. No. 3,709,447.
This application Oct. 26, 1972, Ser. No. 301,162
Int. Cl. H02k 15/00
U.S. Cl. 29—596 10 Claims



Winding accommodating laminated structures having insulating member formed in situ thereon and method and apparatus for making same. Insulating member may include winding retaining elements that are useful while arranging one or more windings on the structure and for maintaining the winding in a desired position on the structure. Insulating member may be used to secure individual laminations together and may include winding termination holding and protecting means. A preferred method includes forming an insulating member in situ on a stack of laminations which may be variable in height by placing the laminations in a mold cavity, closing a mold with a sufficient force to contain unhardened insulating material to be later admitted to the cavity and urging the laminations against an abutment in the cavity with a force less than the force used to close the mold. The apparatus includes mold parts that can accommodate laminations stacked to various heights and includes stack height accommodating means which may be spring biased pressure pins. The overall dimension of the insulated structure is preselected and fixed for a given nominal lamination stack height and variations in dimensions that would otherwise occur due to variations in stack height is taken up or compensated for by the formation of a layer of insulating material having a correspondingly increased or decreased thickness. Auxiliary structural member is formed integral with an insulating member to provide mounting means having a predetermined relationship with stator laminations.

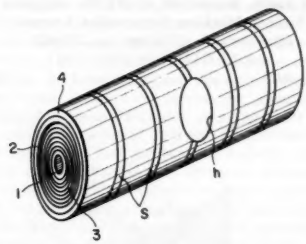
In other embodiments, insulating material is formed around winding turns to substantially completely encase the turns with insulating material. In another embodiment, the auxiliary structural members may be pads, means for mounting elements such as carbon brushes, or means for mounting an inductive device to suitable supporting structure.

3,813,764

METHOD OF PRODUCING LAMINATED PANCAKE TYPE SUPERCONDUCTIVE MAGNETS

Eihachiro Tanaka; Yutaka Onodera, both of Sendai; Takeji Fukuda, Kanuma; Tsutomu Yamashita, Sendai, and Shoji Kuma, Hitachi, all of Japan, assignors to The Research Institute for Iron Steel and Other Metals, Sendai City, Japan

Division of Ser. No. 10,971, Feb. 12, 1970, Pat. No. 3,652,967.
This application Jan. 18, 1971, Ser. No. 107,467
Claims priority, application Japan, June 9, 1969, 44-44615
Int. Cl. H01v 11/14
U.S. Cl. 29—599 7 Claims

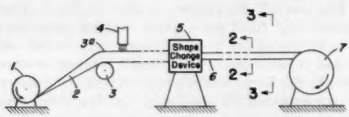


A superconductive magnet comprises superconductive coiled layers; diffusion shielding coiled layers, between which the superconductive coiled layer is put; stabilizing conductor coiled layers, between which the diffusion shielding coiled layer is put; and a normal conductor acting as a superconductive insulation between the superconductive coiled layers. Said superconductive magnet is produced by laminating thin sheets of metal or alloy to constitute the superconductive material in such a ratio that a superconductive alloy or intermetallic compound is formed, superposing thin sheets of metal or alloy shielding diffusion against the former thin sheets and thin sheets of metal or alloy stabilizing the superconductivity on both the surfaces of the laminated sheets respectively, coiling the formed sheets on a core sheath in multilayer, covering the resulting coiled body with an outer sheath, subjecting the assembly to a diameter reducing treatment to adhere the layers and heating the adhered layers until the superconductive alloy or intermetallic compound is formed.

3,813,765
METHOD OF MANUFACTURING TUBULAR ELECTROMAGNETIC WAVE GUIDES

Klaus Prinzhorn, Burgdorf, and Dieter Hein, Hannover, both of Germany, assignors to Kabel-und Metallwerk Gutehoffnungshuette A.G., Hanover, Germany

Filed May 12, 1972, Ser. No. 252,833
Claims priority, application Germany, May 21, 1971, 2125189
Int. Cl. H01p 11/00
U.S. Cl. 29—600 4 Claims

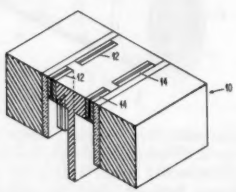


In the manufacture of a tubular electromagnetic wave guide having a non-circular internal cross section, wherein a conductive tape is initially formed into a tubular wave guide having preferably a circular internal cross section, and a welded longitudinal seam varying in thickness that presents an uneven surface in the interior of the wave guide to cause wave reflection to impair wave transmission, the process which comprises: changing the initial internal cross sectional configuration of the wave guide into a non-circular cross sectional configuration in such a manner as to position the uneven surface of the welded longitudinal seam at a location in the interior of said wave guide whereat the electrical field intensity of the electromagnetic wave to be transmitted by such wave guide would be at an approximate minimum value, thus causing a corresponding minimum wave reflection for improving the wave transmission characteristics of the wave guide.

3,813,766
PROCESS FOR MANUFACTURE OF A MAGNETIC TRANSDUCER USING A PRE-EXISTING UNITARY FOIL

George W. Brock, Boulder; Wayne McCormick, Arvada, and Sidney H. Smith, Broomfield, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1971, Ser. No. 210,021
Int. Cl. G11b 5/16, 5/20, 5/42
U.S. Cl. 29—603 10 Claims



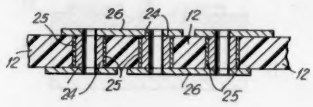
Magnetic transducing heads capable of reading and writing magnetic information in the form of a pattern of magnetization on a magnetic recording medium are provided utilizing a unitary structure of magnetic sheet metal foil and conductive, non-magnetic metal foil and thin film deposition techniques. In the preferred embodiment, the transducing heads consist of a monolithic sandwich of thin metallic magnetic foil forming a magnetic core enclosing a conductive non-magnetic metal foil exciting winding.

The transducer is prepared from a prefabricated unitary laminate of magnetic metal foil and conductive metal foil which laminate is shaped into a magnetic head by, for example, photolithographic and deposition techniques.

3,813,767
METHOD OF MANUFACTURE OF ANNULAR MAGNETIC CORES

Hajime Sasaki, Kazuo Yamagishi, Sukeyoshi Sakai, all of Yokohama, and Toshihiro Hoshi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 755,368, Aug. 26, 1968. This application July 21, 1971, Ser. No. 164,891
Claims priority, application Japan, Aug. 28, 1967, 42/55427
Int. Cl. H01f 7/06
U.S. Cl. 29—604 7 Claims

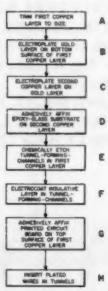


A plurality of core wires each covered by a layer of magnetic material are positioned in a desired arrangement relative to each other. The arrangement of covered core wires is embedded in molding material. The molding material is hardened to firmly affix the covered core wires in their arranged positions. A section of the molded arrangement of covered wires is removed at substantially right angles to the axes of the wires. Each of the core wires is then removed from the section and the layer of magnetic material of each is retained in the section.

3,813,768
METHOD OF FORMING A TUNNEL STRUCTURE FOR A MAGNETIC PLATED-WIRE MEMORY ARRAY

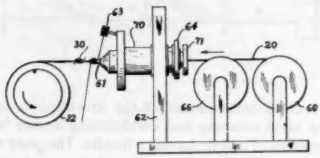
Le Roy A. Prohofsky, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,258
Int. Cl. H01f 7/06
U.S. Cl. 29—604 2 Claims



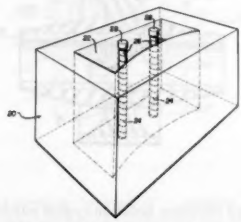
A method of forming a tunnel structure for a plated-wire memory array in which the tunnels are uniformly displaced from the tunnel surface upon which are located the copper word lines is disclosed. The method includes gold plating one surface of a first copper layer of a precise thickness, affixing a second copper layer to the gold layer, chemically etching parallel grooves in the open surface of the first copper layer through to the gold layer and then laminating the necessary substrate and printed circuit word lines to the opposing surfaces of the copper and gold layers to form the tunnel structure. The precise thickness of the first copper layer establishes the uniform spacing between the parallel printed circuit word lines and the orthogonally oriented plated-wire bit lines that are confined by the parallel groove-forming tunnels to minimize cross-point capacitance variation therebetween.

3,813,769
METHOD OF MAKING A DOMAIN WALL PROPAGATING DEVICE
Philip Sherman, San Diego, Calif., assignor to Instrument Development Laboratories, Inc., Wantagh, N.Y.
Division of Ser. No. 288,895, Sept. 14, 1972, Pat. No. 3,789,374. This application Aug. 22, 1973, Ser. No. 390,573
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **2 Claims**



A domain wall propagating device with a magnetic wire wound in grooves on a substrate. Coils wound around the wire are placed in recesses in the substrate. A propagating winding is wrapped around the substrate, and the device may be covered with a magnetic shielding layer. To avoid damaging the magnetic wire during the fabrication of the device, the coils are wound on a tubular mandrel through which the magnetic wire extends. The magnetic wire may be supported in a channel formed between a pair of non-magnetic wires bonded together.

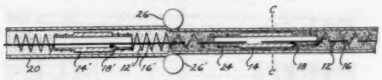
3,813,770
METHOD OF ENCAPSULATING COILS
Edward J. Sopcak, Howell, Mich., assignor to Jetro-Matic International Corporation, Denver, Colo.
Filed Apr. 19, 1973, Ser. No. 352,816
Int. Cl. H01f *7/06*
U.S. Cl. 29—605 **12 Claims**



A method of encapsulating conductive coils, including coating the coil with a refractory suspended in a volatilizable organic carrier, heating the coil to volatilize the carrier and leaving a film residue of refractory, and potting the coil in aluminum or the like by pouring molten metal around the coil. The disclosed device includes two copper coils wound in the same direction about common axes and an aluminum body completely encapsulating the coils.

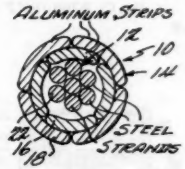
3,813,771
METHOD OF PRODUCING ELECTRICAL RESISTANCE HEATERS, AND THE IMPROVED HEATER PRODUCTS
Thorbjorn Skogland, Shelbyville, Ind., assignor to General Electric Company, Indianapolis, Ind.
Filed July 2, 1973, Ser. No. 376,103
Int. Cl. H01c *15/04, 17/00*
U.S. Cl. 29—615 **15 Claims**

This disclosure relates to a method of making an electrical heating unit comprising a concentric assembly of a helical wire electrical resistance heating element embedded in particulate insulating material and enclosed within an elongated sheath. The method comprises means for controlling the longitudinal expansion of the helix of the wire heating element and the uniformity of the helical pattern of the wire extending



along the length of the heating unit. The disclosure also includes the improved products of the method which have more uniform heating capacities. This disclosure is especially advantageous and effective in continuous manufacturing systems for the formation and assembly of electrical heating units in extended uninterrupted lengths.

3,813,772
METHOD OF FORMING STEEL SUPPORTED ALUMINUM OVERHEAD CONDUCTORS
Harold W. Adams, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Division of Ser. No. 51,128, June 30, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,161
Int. Cl. H01b *13/26*
U.S. Cl. 29—624 **1 Claim**

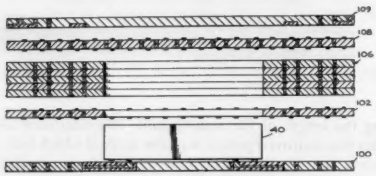


The conductors disclosed herein each comprise a hollow tube of aluminum supported on a steel cable received within the tube. The cable has a smaller outside diameter than the inside diameter of the aluminum tube. The latter need not be integral; it may be fabricated from flat strips, wires or rods, shaped or round. Strips, wires or rods are stranded over the cable; integral tubes are extruded over the cable or folded over the cable from a broad strip and longitudinally welded. Soft aluminum wires may be stranded radially between the steel cable and the hard-drawn aluminum conductor, then crushed by the application of radial pressure to provide internal space between the aluminum covered steel core and the hard-drawn aluminum conductor. Under operating conditions, substantially all mechanical tension on the steel supported aluminum overhead conductor is borne by the steel cable and the conductor is largely immune to hazards of galloping, aeolian vibration, loss of strength as a result of high operating temperatures, and creep at normal and high operating temperatures.

3,813,773
METHOD EMPLOYING PRECISION STAMPING FOR FABRICATING THE WAFERS OF A MULTIWAFER ELECTRICAL CIRCUIT STRUCTURE
Howard Lee Parks, Woodland Hills, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Sept. 5, 1972, Ser. No. 286,163
Int. Cl. H01r *9/00*
U.S. Cl. 29—630 R **17 Claims**

A low-cost method employing precision stamping for fabricating the wafers of a multiwafer electrical circuit structure comprised of a plurality of electrically conductive wafers

stacked together under pressure. A stack is normally comprised of conductive wafers of different types including component wafers, interconnection wafers, and connector wafers which are fabricated to provide X, Y and Z-axis coaxial connections between components in the stack. In accordance



with the present invention, these X, Y and Z coaxial connections are fabricated directly from the wafer material itself at relatively low cost as compared to known methods as a result of the employment of a novel combination of precision stamping, dielectric filling and sanding or etching steps.

3,813,774

ELECTRICALLY OPERATED DRYSHAVER

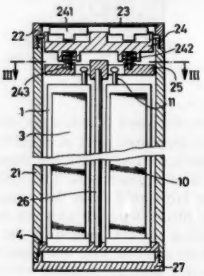
Claus Christian Cobarg, Steinbach/Taunus, Germany, assignor to Braun AG, Frankfurt/Main, Germany

Filed Nov. 6, 1972, Ser. No. 304,252

Claims priority, application Germany, Nov. 5, 1971, 2154974; Aug. 17, 1972, 2240381

Int. Cl. B26b *19/12*

U.S. Cl. 30—43.9 **18 Claims**



A housing is provided with a shearhead having an opening, a perforated shearfoil spans the opening and underneath the shearfoil are mounted shear blades the cutting edges of which contact the shearfoil. A drive is coupled with the blades for making the same move relative to the shearfoil; it has at least one flexural unit composed of a plurality of bilaminar flexural oscillators of ferro-electric ceramic material which are mechanically coupled so that they perform their movements in unison.

3,813,775

MEAT CLEANER AND CONDITIONER

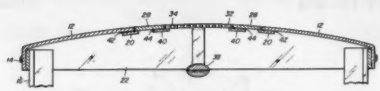
Robert E. Fitzgerald, 8203 Gumtree Dr., Baltimore, Md. 21222

Filed May 17, 1972, Ser. No. 254,316

Int. Cl. A22c *17/00*

U.S. Cl. 30—279 R **3 Claims**

A meat cleaning and conditioning device is provided for removing meat and bone dust from large or small quantities of freshly cut meat. In one embodiment of the invention, the device consists of a base having an upper convex surface with an opening therein. A cleaning and conditioning plate, also of convex shape, is positioned in the opening. This plate has spaced apertures therein, with the apertures having sharp cutting edges for removing bone and meat dust from the surface of the meat being cleaned thereof.



In a second embodiment of the invention, a small hand operated meat cleaning and conditioning device is provided which consists of a plate having a handle. The plate has spaced apertures provided therethrough and the apertures are provided with sharp cutting edges. This device can be hand operated or adapted for use in conjunction with the permanent base mentioned above.

3,813,776

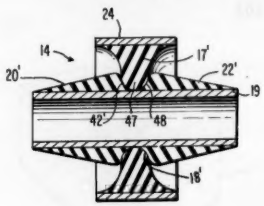
VIBRATION ISOLATION SYSTEM PARTICULARLY ADAPTED FOR USE WITH A CHAIN SAW

Robert Eugene Frederickson, South Gate, and Walter Joseph Hammond, Lakewood, both of Calif., assignors to McCullough Corporation, Los Angeles, Calif.

Filed May 15, 1973, Ser. No. 360,561

Int. Cl. B27b *17/02*; **F16f** *7/12*

U.S. Cl. 30—381 **7 Claims**



An improved vibration isolation system particularly adapted for use with a chain saw and characterized by a diaphragm, journaled on shaft means, and engaged on either side by resilient impedance means. The shaft means may be connected with a vibrating assembly which includes a chain saw engine and cutter chain, while the diaphragm means may be connected with a support means within which the vibrating assembly is resiliently supported.

3,813,777

INTRA-ORAL METHOD OF MAKING DENTURES

Ambrose B. Van Handel, 8653 Louise Ave., Northridge, Calif. 91324, and Jerome J. Brent, 15 La Crescenta Dr., Camarillo, Calif. 93100

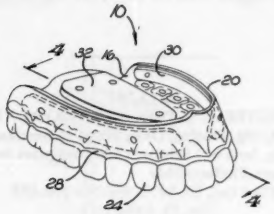
Filed Sept. 25, 1972, Ser. No. 291,860

Int. Cl. A61c *13/00*

U.S. Cl. 32—2 **4 Claims**

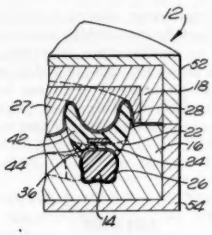
Dentures made by curing a base material within a wax moldable tray. The wax tray is softened by body temperature and molded within a patient's mouth by use of tongue, cheek and lips before the base material in a plastic state is inserted.

The plastic base material bonds to adjustably positioned synthetic teeth projecting from the tray and is molded directly on the gums of the patient to form the gum bearing surfaces.



Thereafter, the wax tray is boiled away leaving a finished denture with a lifelike gum surface that requires little if any finishing.

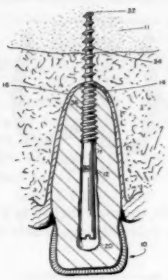
3,813,778
FLEXIBLE ARTIFICIAL DENTURE
Ambrose B. Van Handel, 8653 Louise Ave., Northridge, Calif. 91324
Filed Dec. 1, 1972, Ser. No. 311,066
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **14 Claims**



An artificial denture formed of a resilient base member which may or may not have a reinforcing bar encased therein. The base member secures the synthetic teeth in their respective positions. During mastication, the resilient base acts as a shock absorber of the traumatic masticating pressure by allowing a limited movement of the individual teeth in the resilient base toward the dental ridge. Because of the absorption of the shock of masticating force, the resilient denture base remains stable on the dental ridge, thereby overcoming the trauma and needless movements inherent in the hard denture base in relation to the dental ridge.

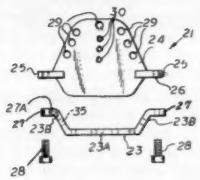
3,813,779
METHOD AND APPARATUS FOR SEALING ROOT CANALS AND ANCHORING TEETH
Anthony Tosti, 19 Melbourne Rd., Norwalk, Conn. 06851
Continuation of Ser. No. 846,164, July 30, 1969, abandoned. This application May 7, 1971, Ser. No. 141,349
Int. Cl. A61c *5/08*
U.S. Cl. 32—13 **2 Claims**

A threaded root canal filler is provided to hermetically seal the apical one-third of a root canal of a tooth when pulp has been removed therefrom. Further, the filler may also provide a secure mounting of the tooth to the jaw bone by providing a



greater root-to-crown tooth ratio while still maintaining a hermetic seal in the root canal.

3,813,780
DENTAL CLUTCH FORMER
William B. Dragan, RFD No. 1 Burr St., Fairfield, Conn. 06430
Filed Aug. 10, 1972, Ser. No. 279,288
Int. Cl. A61c *9/00*
U.S. Cl. 32—19 **10 Claims**

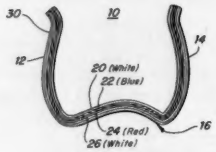


This disclosure is directed to an improved dental clutch former and method of using the same. Essentially the dental clutch former includes an upper jaw former and a lower jaw former. Each former comprises a front member detachably connected to its respective back plate member. A separating member is provided and it is arranged to be disposed between the respective back plate of the formers during their use in making the clutches. To facilitate the making of the clutches, readily adjustable jig holding members are detachably secured to the respective front members of the former to provide for relative anterior-posterior adjustment of the respective jaw formers. In use, adaptor plates are adjustably positioned onto the respective front members whereby the clutch formers, fixed in one's mouth or bite model, may be universally adapted for attachment to any of several different recording devices.

3,813,781
BRUXISM MONITORING DEVICE
Albert Gerard Forgione, 5 Rollstone Rd., Marblehead, Mass. 01945
Filed Sept. 4, 1973, Ser. No. 394,349
Int. Cl. A61c *9/00*
U.S. Cl. 32—19 **6 Claims**

A bruxism monitoring device comprising a flexible, inelastic mouthpiece for snugly engaging one of every pair of occluding teeth whereat bruxism is to be monitored, the mouthpiece having generally vertical sidewalls providing one or more

recesses to receive one or more teeth and a thin biting plate interconnecting the side walls for disposition between upper and



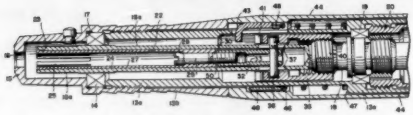
lower occluding teeth, the plate including a plurality of layers, each layer having a color distinguishable from the colors of adjacent layers.

3,813,782

COLLET ADJUSTING MECHANISM FOR DENTAL HANDPIECES

John D. Nilles, Roselle, and Frank R. Hruby, Broadview, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 17, 1972, Ser. No. 253,958
Int. Cl. A61c *1/08*
U.S. Cl. 32—26 **16 Claims**



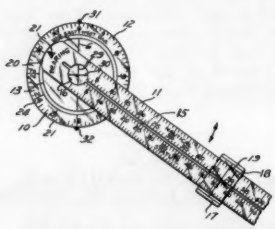
A straight handpiece having a rotatable outer sleeve which is capable of limited axial movement into a retracted position. Upon retraction, the sleeve becomes operatively coupled to a drawbar nut which is in turn connected to a collet drawbar projecting forwardly within the spindle of the handpiece. A collet is detachably secured to the front of the drawbar so that upon rotation of the sleeve the collet is retracted or extended to grip or release a dental bur.

3,813,783

RADIO NAVIGATION PLOTTER

Richard J. Price, 1427 W. Mango St., Lantana, Fla. 33460

Filed Feb. 22, 1972, Ser. No. 227,975
Int. Cl. G01c *21/20*
U.S. Cl. 33—1 SD **4 Claims**



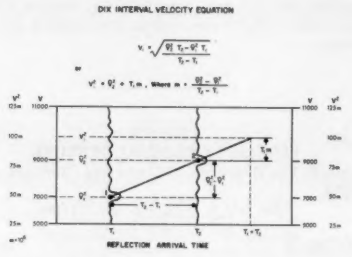
A radio navigation plotter having: (1) a circular transparent upper disc with a 360 degree scale on its periphery and a circular line for registration with an OMNI station circle on a chart; (2) a circular transparent lower disc having a center marking, a diametrical North-South line, and two series each of closely spaced North-South and East-West lines to facilitate aligning the diametrical North-South line with a North- South line on a chart; and (3) an elongated arm pivoted centrally on the discs and having a longitudinal slot extending radially outward at one side of the discs and a bearing marker registering with the 360 degree scale on the upper disc at the opposite side.

3,813,784

GRAPHIC DETERMINATION OF INTERVAL VELOCITY

Frederick S. Gillig, Findlay, Ohio; Frank R. Smolka, and Lynn D. Trembly, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Oct. 10, 1972, Ser. No. 296,488
Int. Cl. G06g *1/16*
U.S. Cl. 33—1 HH **3 Claims**



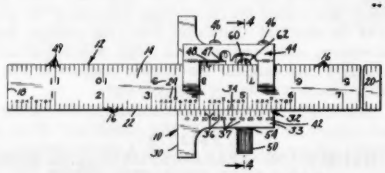
Velocity in a subterranean interval is determined graphically from Root-Mean-Square (RMS) velocities at the end point of intervals by plotting time vs. velocity squared. A straight line can be drawn through the end points and the intersection of that straight line at $T_1 + T_2$ can be read directly as the velocity of the interval. Alternately, a special template can be used with conventional plotting of time vs. velocity.

3,813,785

VERNIER ATTACHMENT

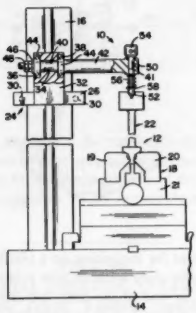
Otis M. Larsen, 4036 Reservoir Blvd., Minneapolis, Minn. 55421

Filed Oct. 12, 1971, Ser. No. 188,242
Int. Cl. G01b *5/18*
U.S. Cl. 33—169 B **4 Claims**



A vernier block, for attachment to a standard measuring blade, in which the block working edge provides the primary measurement between the blade and the working edge, and in which the block is in a gauge block having a scale which, in conjunction with the blade scale, acts as a vernier.

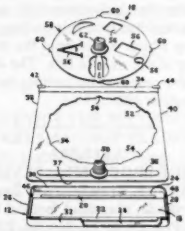
3,813,786
GAUGE ADAPTER
Martin Andrew Herman, 2085 114st St., Cleveland, Ohio 44102
Filed Jan. 18, 1972, Ser. No. 218,764
Int. Cl. G01b 3/00; B23q 3/00
U.S. Cl. 33—174 P 6 Claims



A gauge adapter for use on a gauge having a base with a test article positioning means thereon to position a test article in an up-right position, and an upright secured to the base. A support means forms a part of the gauge adapter and is attachable to the upright and rotatably positions a support arm which extends therefrom. A locater pin is resiliently carried by the support arm and is perpendicular there-to to be positioned for movement in an arc in a vertical plane including the center line of the test article, the locater pin being engageable with the upper end of the test article.

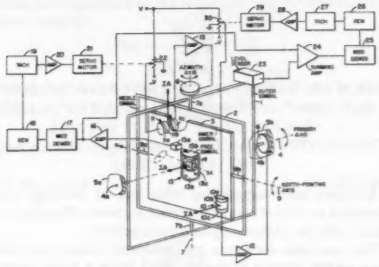
The gauge adapter of the invention is particularly adapted for use as an attachment to any of various types of gauges in existence today and is particularly provided to permit slight arcuate movement of the test article on its center line to facilitate gauging actions on the article.

3,813,787
APPARATUS FOR DRAWING DESIGNS
John N. Mercorelli, 1265 Van Houten Ave., Clifton, N.J. 07013
Filed Feb. 2, 1972, Ser. No. 222,802
Int. Cl. G09b 1/22, 1/04, 1/30
U.S. Cl. 33—174 B 10 Claims



A stencil apparatus for producing designs on a piece of paper, consisting of a circular stencil indexed in a mating aperture of a cover plate. The cover plate coacts with a base member to hold the paper in fixed relation to the cover plate to insure that the stencil will not be misaligned with the paper when the stencil is moved from one position to another. The stencil can be indexed between several different positions in the aperture of the cover plate. Means are provided to conveniently move the stencil to the various index positions in the cover plate aperture, and means are also provided in the cover to conveniently place the paper in the proper position between the cover plate and base member.

3,813,788
DYNAMIC PENDULUM NORTH-SEEKING GYRO APPARATUS
James V. Johnston, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 11,156, Feb. 13, 1970, abandoned.
This application Feb. 22, 1972, Ser. No. 228,302
Int. Cl. G01c 19/38
U.S. Cl. 33—321 2 Claims



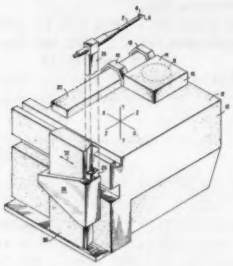
A gyro that is free about its vertical axis is carried on a vertical stabilized gimbal. The gimbal is the innermost (inner) of three gimbals, and is supported for rotation about a horizontal north-seeking axis by a middle gimbal. The middle gimbal is supported for rotation about an azimuth axis by the outermost (outer) gimbal. The outer gimbal is able to rotate about a primary horizontal axis and is supported by a housing. The housing may be earth-fixed or so carried by a vehicle that the primary axis journals are stabilized level and approximately E-W. The designated axes are not necessarily the same as the vehicle axes, but are used only to show axes of the north-seeking system. The system may be isolated from the vehicle axes. The free gyro tends to align itself with a north-south line. An output is taken indicative of the relative positions of the gimbal of the free gyro and the north-seeking axis. This output is used as an input both to an azimuth rate integrating single-degree gyro for the inner gimbal, and as one input to a summer feeding the torquer of a single-degree N-S tilt rate integrating gyro on the inner gimbal. The other input to the summer is provided by a N-S tilt sensor carried by the outer gimbal. The output of the azimuth gyro is fed to a torquer between the outer gimbal and the middle gimbal. The output of the N-S tilt rate integrating gyro is fed to a torquer between the housing and the outer gimbal. With this overall arrangement, the free gyro acts like a pendulum, and its spin axis describes an ellipse around a north-south line. Therefore, the mean direction of the spin axis of the free gyro is a north-south line, and the horizontal supporting axis of the inner gimbal seeks a north-south direction.

3,813,789
MEASURING APPARATUS
Russell S. Shelton, Paducah, Ky., assignor to Shelton Metrology Laboratory, Inc., Paducah, Ky.
Filed June 26, 1967, Ser. No. 648,805
Int. Cl. G01b 5/02
U.S. Cl. 33—174 L 26 Claims

Measuring apparatus employing an accurate planar reference surface of granite has a movable probe and a movable workpiece, both of which have their movements guided by and related directly to the reference surface. The movable

members are supported on air bearings which have regulatable air supplies to permit accurate calibration and adjustment of the apparatus. Electronic scales measure the displacement of the movable elements along their paths of movement.

The probes operate optically or by contact with a workpiece. The contact probe is mounted directly on the optical probe and has its contacting point lying on the line-of-sight of the optical probe.



A rotary work-supporting table has air bearings rotatable therewith so that it may be rotated without affecting its parallelism with the underlying reference surface.

The movable elements are positively driven by hydraulic rams which receive hydraulic fluid from a hydro-pneumatic system involving reservoirs connectable with low pressure air or high pressure air. Metering valves control the flow of hydraulic fluid to and from the reservoirs.

3,813,790

SIGHTING MEANS FOR FIREARMS

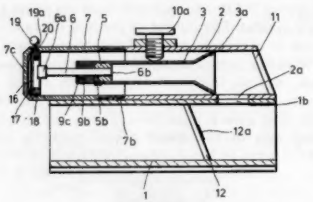
Hans-Joachim Kaltmann, Dusseldorf, Germany, assignor to Firma Rheinmetall GmbH, Dusseldorf, Germany

Filed Sept. 1, 1972, Ser. No. 285,802

Claims priority, application Germany, Oct. 7, 1971, 2149980

Int. Cl. F41g *1/32, 1/42*

U.S. Cl. 33—241 **4 Claims**



A sighting means for a firearm with a lower tube for viewing the target and an upper tube containing a so-called light rod and producing light emission from its rear end to produce a light image for sighting in the eye of a marksman via an optical system and mirror within the lower tube, the light rod being located within a cover at the forward end of the upper tube and being arranged for illumination by incident ambient light and/or a light emitting source within the cover.

3,813,791

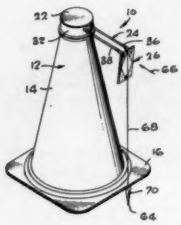
SURVEYOR'S TARGET

Larry C. Stewart, 7104 Jordan Ave., Apt. 4, and Stephan C. Taylor, 20409 B Altar St., both of Los Angeles, Calif. 91304

Filed May 2, 1972, Ser. No. 248,960

Int. Cl. G01c *15/00, 15/08*

U.S. Cl. 33—263 **15 Claims**



Surveyor's target for mounting on a traffic cone comprising a cap for the traffic cone with an arm extending from the cap and a target on the end of the arm, the arm being sufficiently long that, when a plumb bob is dropped from the target, it hangs beyond the base of the cone.

3,813,792

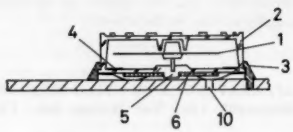
DEVICE FOR DECLINATION CORRECTION OF A MAGNETIC COMPASS

Kauko Olavi Jarvenpaa, Helsinki, Finland, assignor to Suunto Oy, Vanhakartano, Finland

Filed Nov. 3, 1971, Ser. No. 195,309

Int. Cl. G01c *17/04*

U.S. Cl. 33—356 **1 Claim**



A device for correcting the declination of a magnetic compass includes a needle box rotatable relatively to a base plate and a concentric declination disk. The device is particularly characterized in that the declination disk turns along with the needle box by friction but that this turning can be prevented by providing a stop which would hold the declination disk but permit the turning of the needle box. The desired declination reading is set on the compass by turning the needle box while holding the declination disk.

3,813,793

CROP PROCESSING DEVICES

Cornelis van der Lely, 7, Bruschenrain, Zug, and Ary van der Lely, 10, Weverskade, Maasland, both of Netherlands

Filed Feb. 29, 1972, Ser. No. 230,230

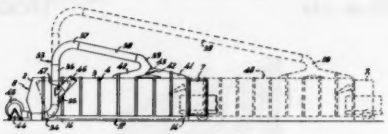
Claims priority, application Netherlands, Mar. 3, 1971, 7102792

Int. Cl. F26b *17/10*

U.S. Cl. 34—57 R **40 Claims**

A crop drying device includes an enclosed chamber with at least one blower in a conveying channel that extends from one drying zone to another drying zone. Endless conveyors move crop within the chamber as crop is recycled through the device. A heating system is associated with the blower to heat

the air stream in the conveying channel and zones. The device is particularly adapted for drying long-leafed or long-stemmed crop and a rotatable dosing mechanism with tines is positioned at an angle to the rear of the chamber to move the crop from



one conveyor to another. The rotatable dosing device has tines that are moved to pick up small doses of crop and deposit same on conveyors at the lower portion of the device. Flaps in the conveying channel can be set to recycle or move the crop to a storage area.

3,813,794

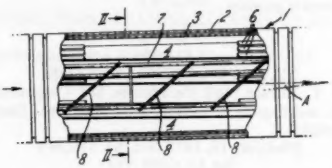
MATERIAL TREATING APPARATUS

Tadeusz Bronislaw Jawor, London, England, assignor to Molins Machines Company Limited, London, England

Continuation of Ser. No. 61,152, Aug. 5, 1970, abandoned. This application Mar. 14, 1972, Ser. No. 234,565

Int. Cl. F26g *11/04*

U.S. Cl. 34—136 **15 Claims**



Apparatus for treating, especially drying or humidifying, tobacco or like material comprises a rotating drum inclined to the horizontal and fitted with longitudinally-extending internal shelves so that material placed in the drum is repeatedly lifted by the shelves and dropped as the shelves tilt with drum rotation, the material simultaneously progressing towards the lower end of the drum. Within the drum, one or more stationary guides are disposed to catch material falling from the selected upper area of the drum and guide it towards the higher end, the arrangement being such that moister material is so caught while drier material falls clear of the guides.

3,813,795

LASER DEVICE FOR MOVING TARGET MARKSMANSHIP TRAINING

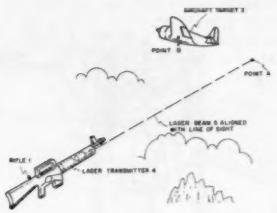
Albert H. Marshall, Maitland, and George A. Siragusa, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 8, 1973, Ser. No. 368,160

Int. Cl. F41c *27/00*

U.S. Cl. 35—25 **3 Claims**

A rifle or light machine gun is equipped with a transmitter for projecting a laser beam and an adjustable beam aiming mechanism. A moving target having a laser beam receiver affixed thereto is provided. When a trainee aims his rifle at the target and pulls the trigger a laser beam is projected towards the target. If the beam strikes the target, the receiver emits a signal. Since the target is moving the trainee must "lead" it correctly to score a hit. The aiming mechanism is adjusted to compensate for the difference in the time of flight of a bullet



and the laser beam. Therefore a trainee firing the laser beam learns the leads required to hit targets of various speeds with a particular weapon.

3,813,796

ANCHORING BASE FOR THE LACINGS OF SKI BOOTS

Icaro Olivieri, Via Feltrina 10, Montebelluna (Teviso), Italy

Filed July 31, 1973, Ser. No. 384,345

Claims priority, application Italy, Mar. 21, 1973, 21896/73

Int. Cl. A43b *11/00*

U.S. Cl. 36—2.5 AL **5 Claims**

Ski boots have a special form of lacing comprising a plurality of levers pivotally mounted on one side of the boot and a plurality of loops mounted on the other side of the boot. The levers have a plurality of notches in one face and a selected one of these is engaged by the associated loop and the lever moved to tension the loop, the tension holding the lever in position. The levers and loops are attached to the boot by means of anchoring bases which have an integrally formed single riveting element which is upset following insertion into a hole in the boot to form a quickly made attachment to the boot. Pivotal movement of the anchoring base about the riveting element is possible and this can be restricted by means of integrally formed studs housed in over-size holes in the boot adjacent the main hole throughwhich extends the main riveting element.

3,813,797

MULTIPLE FILM VIEWER AND STORAGE CABINET

Cardinal M. Masters, Bethlehem; Willard H. Reed, Pen Argyl, and Ralph H. Wentzell, Wind Gap, all of Pa., assignors to A. M. Masters & Sons, Inc., Penn Argyl, Pa.

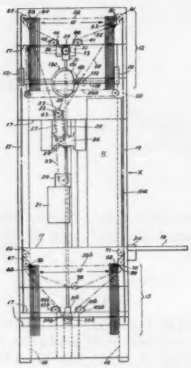
Filed Sept. 14, 1971, Ser. No. 180,258

Int. Cl. G09f *11/32*

U.S. Cl. 40—36 **11 Claims**

An apparatus for storing and examining film transparencies, X-Ray films and the like including an illuminator having a viewing surface over which the film to be examined can be superimposed, a panel train having a plurality of film carrying panels, a panel storage region including two storage sections separated by the illuminator, one section above the illuminator and one section under the illuminator, two panel transfer

trackways extending between the storage sections, one trackway in front of the illuminator and one trackway behind the illuminator, the front transfer trackway being positioned

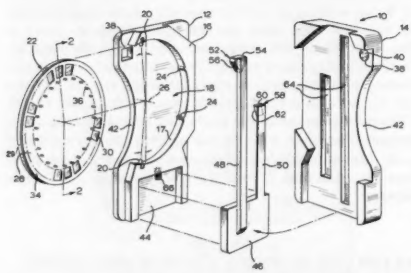


so that a panel carried thereon will lie in a plane parallel to the viewing surface; each storage section being adapted to store the panels in vertical parallel planes; and panel moving means adapted to move the panel train through the apparatus.

3,813,798
VIEWER

Fahim Jacob Shasha, 49 Chipwood Crescent, Willowdale 425, Ontario, Canada

Filed May 2, 1973, Ser. No. 356,312
Int. Cl. G09b *3/06*
U.S. Cl. 40—70 **8 Claims**

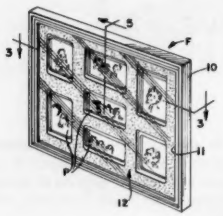


A picture viewer of the type using an interchangeable carrier having a circular row of transparency frames, the removable carrier being rotatable in a cavity in a housing having a viewing aperture. A circle of lateral projections is located on the wheel, one projection being associated with each frame. A plunger carries a pair of arms projecting into the cavity parallel to the wheel. One arm carries wedge means engagable between a pair of the projections and the other arm carries pusher means bearable against a projection. On depressing the plunger the wedge means is disengaged from the projections and the pusher means rotates the wheel.

3,813,799
PICTURE FRAME FOR FRAMING AND HOLDING A PLURALITY OF PICTURES

John Caravello, P.O. Box 141, Norwich, N.Y. 13815

Filed Nov. 20, 1972, Ser. No. 307,849
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **13 Claims**

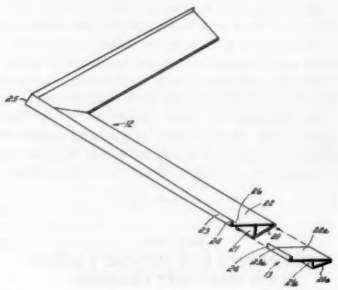


A picture frame for framing and holding a plurality of pictures in predetermined orientation, comprising a back support frame, an intermediate picture receiving frame having a plurality of pockets therein for receiving pictures and having a plurality of openings in registry with the pockets for displaying pictures in the pockets, and a front support frame having a plurality of openings therethrough in registry with the openings in the intermediate frame for displaying the pictures in the pockets and means thereon for engaging and holding said pictures in position.

3,813,800
EXTENSIBLE DISPLAY FRAME

Webster T. Turner, 982 Paradrome St., Cincinnati, Ohio 45202, and Eugene E. Turner, 1600 Ross Ave., Cincinnati, Ohio 45205

Filed July 16, 1973, Ser. No. 379,369
Int. Cl. G09f *1/12*
U.S. Cl. 40—155 **8 Claims**

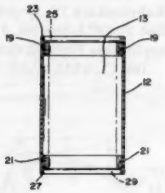


An extensible display frame includes four L-shaped frame members, each having legs comprising elongated back elements, brace elements, framing elements and picture retaining lips. The brace element and framing element extend toward one another from opposite edges of the back elements and at acute angles with respect thereto. The width of the back elements on two of the members is slightly greater than that of two other members so that members having back elements of slightly different widths can be slidingly or telescopically interfitted to form the extensible frame. The joined members are telescoped toward or away from each other to accommodate pictures or items of varying sizes.

3,813,801
ADVERTISING OR NOVELTY DEVICE

Clair D. Vander Schaaf, 4019 S. Lakewood Dr., Memphis, Tenn. 38128

Filed Jan. 8, 1970, Ser. No. 1,517
Int. Cl. G09f *3/00*
U.S. Cl. 40—306 **1 Claim**

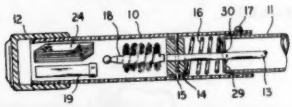


A device for use in the field of advertising or as a novelty. The device comprises a rolled strip of plastic or the like that is preshaped to wrap around a can, such as a soft drink can. The exposed surface thereof would be printed with advertising matter or something novel. The unexposed surface which contacts the can would have at least a portion thereof coated with a plastic foam which serves as an insulator against heat transfer and reduces the formation of condensation.

3,813,802
COMBINATION CLEANING KIT AND GUN SAFETY DEVICE

Peter Di Prospero, 814 W. 25th St., Erie, Pa. 16502

Filed Jan. 8, 1973, Ser. No. 321,820
Int. Cl. F41c *27/08, 31/00*
U.S. Cl. 42—1 N **2 Claims**



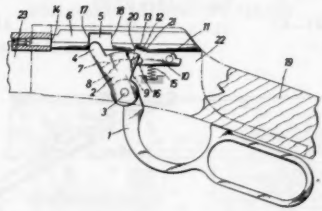
A cleaning kit for a gun made up of a tubular container adapted to fit over the muzzle end of a gun barrel, a closure intermediate the length of the inside of said container, a compression spring is supported on the closure and a washer is supported on the outer end of the spring engaging the muzzle of the gun. The container has a keyhold shaped slot in it that receives the sight of the gun, holding the container in place, and the gun cleaning rod is attached to the closure and extends almost entirely through the gun to its breech so that it acts as a safety device preventing the gun from being loaded when the cleaning device is in position.

3,813,803
LOCKING MEANS FOR BOLT TYPE FIREARMS

Josef Eder, Dachau, and Karl Meierhofer, Weichs, both of Germany, assignors to Erma-Werke Waffen-und Maschinenfabrik GmbH, Dachau, Germany

Filed Apr. 4, 1973, Ser. No. 347,617
Claims priority, application Germany, Apr. 14, 1972, 2218257
Int. Cl. F41c *11/06*
U.S. Cl. 42—16 **3 Claims**

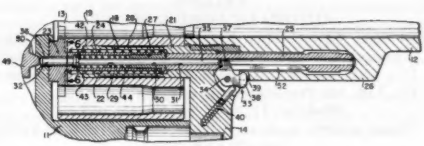
The operation of a repeater hand firearm which has a pivotable element or lever for moving the breech member to close the breech, and a detent catch for holding the breech closed, is simplified by the provision of this catch with a follower which engages in a cam track on the said pivotable element or lever.



3,813,804
REVOLVER CRANE LATCH

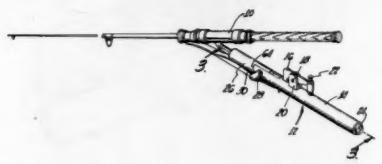
William B. Ruger, Southport, Conn., assignor to Sturm, Ruger & Co. Inc., Southport, Conn.

Filed Mar. 27, 1973, Ser. No. 345,365
Int. Cl. F41c *1/00*
U.S. Cl. 42—62 **8 Claims**



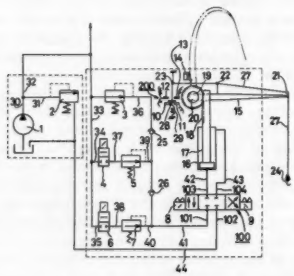
A revolver having a swing-out cylinder that is rotatably mounted on a pivoted cylinder crane is provided with crank latch means for releasably locking the cylinder crane to the frame when the cylinder is in firing position behind the barrel of the revolver. The crane latch means comprises a longitudinally movable rear crane latch plunger mounted on the rearward end of the cylinder and a forward crane latch lever pivotally mounted on the crane below the ejector rod. The rearward end of the crane latch plunger is adapted to be received in a plunger bearing hole formed in the frame immediately to the rear of the cylinder and the crane latch lever has a push rod engaging arm that extends upwardly into the central bore of the ejector rod and a crane locking arm that is adapted to be received in a crane locking recess formed in the main body of the revolver when the cylinder crane is in its closed position. A crane latch push rod is disposed in contiguous central bores formed in the ejector means and ejector rod, the push rod extending from the rear crane latch plunger to the push rod engaging arm of the forward crane latch lever. A crane latch plunger spring urges the crane latch plunger and crane latch push rod rearwardly, and crane latch release means are provided for pressing the crane latch plunger and push rod forwardly against the pressure of said spring. Forward movement of the cane latch release means moves the crane latch plunger and crane latch push rod forwardly, thereby causing the rear crane latch plunger to be disengaged from the plunger bearing hole formed in the frame and also causing the crane locking arm of the forward crane latch lever to be disengaged from the crane locking recess formed in the main body of the revolver.

3,813,805
AUTOMATIC FISHING DEVICE
Leopold Baumstark, 37980 Vineland Ave., Beaumont, Calif. 92223
Filed May 1, 1972, Ser. No. 249,038
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **13 Claims**



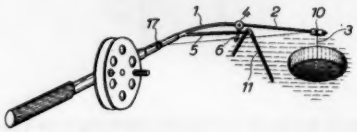
A mechanism for abruptly jerking a fishing rod in response to deflection of the rod caused by a fish biting on a line attached to the rod, so that a hook attached to the line firmly engages the biting fish. The mechanism includes a lever arm secured to the rod and a housing pivotally attached to the lever arm. A member is slidably disposed in the housing and is biased toward the lever arm by a spring. A trigger on the housing holds the member in cocked position at an angle to the lever arm but when a fish pulls on the line the trigger releases the member which engages the lever arm to pivot relative thereto into alignment with the lever arm and jerks the lever arm and the fishing rod to cause the hook to be embedded in the fish's mouth.

3,813,806
AUTOMATIC FISHING DEVICE
Koji Nishi, Chiryu; Itsuo Kumakura, Takahama, and Ukio Hamaguchi, Shima, all of Japan, assignors to Aishin Seiki Co., Ltd., Kariya City and Hamaguchi Indicator Industry Co., Ltd., Mie Prefecture, both of Japan
Filed Oct. 12, 1972, Ser. No. 296,957
Claims priority, application Japan, Oct. 16, 1971, 46-81975
Int. Cl. A01k *97/12*
U.S. Cl. 43—15 **16 Claims**



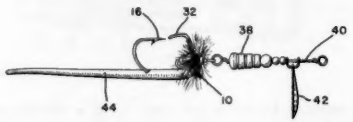
An automatic fishing device which detects a fish on a fishing line through a change in tension of the fishing line is automatically rotatably to operate a fishing rod to fish up or pull in the fish. The device includes a mechanism for varying a fish pulling up force which is automatically increased sequentially with the passage of time commencing when a fish becomes hooked on the line and continuing until the fishing rod reaches a fixed angle. The mechanism comprising an oil pressure changing mechanism wherein different oil pressures are sent in electromagnetic cut valves into a cylinder for pulling up the fishing rod. The control of the valves is effected by an electric circuit which is operable to change in sequence the energization of solenoids which effect the opening and closing of the electromagnetic valves in accordance with the passage of time. According to an alternate embodiment, a mechanism is adapted to provide a sequential changing of the energization of the solenoids which effect the opening and closing of the cut valves in accordance with the rotation of a drum which is rotated by a motor.

3,813,807
FISHING ROD
Aaro Arvo Ruppa, Kohnionkatu 75, Jyvaskyla, Finland
Filed Dec. 6, 1972, Ser. No. 312,496
Claims priority, application Finland, Oct. 27, 1972, 2987/72
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **10 Claims**



A fishing rod consisting of two parts abutting to form a trunk part and a tip part, the fishing line departing downwardly from the latter. The parts are mutually connected by a pivot to be turnable in a vertical plane. The trunk part and the tip part are provided with arms projecting from them in a vertical plane and interacting with each other. The arms, under elastic yielding of the trunk part, are interlockable so that at a downwardly directed tug on the line, the interlocking is released and the tip part jerks upwardly owing to the elasticity of the trunk part.

3,813,808
FISHHOOK
David L. Goforth, 613 Kemp Rd. W., Greensboro, N.C. 27410
Filed Mar. 9, 1973, Ser. No. 339,571
Int. Cl. A01k *83/00*
U.S. Cl. 43—43.2 **7 Claims**

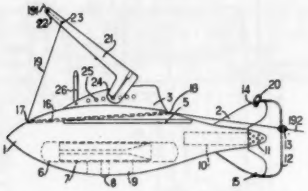


A fishhook including an elongated shank having one end section terminating in an eyelet and the opposite end section terminating in a hook bill and barb. The end sections are integral with an intermediate section which has a generally S-shaped configuration for supporting bait forwardly of the hook bill and barb.

3,813,809
APPARATUS CAPABLE OF BEING SUBMERGED PRINCIPALLY FOR FISHING
Jacques Frotiee, Villa La Retraite Avenue Urbain Bosio, 06 Nice, France
Filed Aug. 11, 1971, Ser. No. 170,826
Claims priority, application France, Aug. 12, 1970, 70.30380
Int. Cl. A01k *95/00*
U.S. Cl. 43—43.13 **8 Claims**

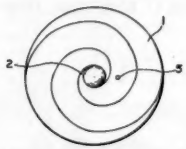
An apparatus capable of being submerged for fishing, adapted to be used on a line and to be displaced relatively in

water, which comprises a body equipped with plane stabilizers of a direction and of a thickness such, that a load being susceptible to modify the position of the center of gravity of said body. A lever is orientable and displacable modifying equally the free equilibrium of the lever. The latter is oriented



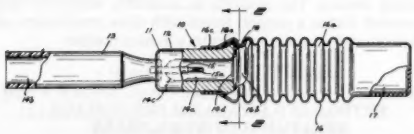
upwardly and forwardly and has at its free end a plurality of holes. A line is secured to one of the holes of the lever and extends through the body and has a fish hook at the extreme end. The tension of the line provokes a jolt to move the lever and causes a rise of said apparatus to the surface of the water, and causes redescending upon release of the tension.

3,813,810
COORDINATION TOP
Eugene J. Majewski, 121 N. Elmore Ave., Park Ridge, Ill. 60068
Filed Feb. 16, 1973, Ser. No. 333,273
Int. Cl. A63h *1/00*
U.S. Cl. 46—64 **3 Claims**



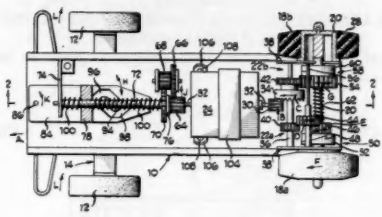
A coordination top comprising a radial surface, rounded rotation surface means centrally thereof, and offset means for imparting rotational movement.

3,813,811
PHEASANT CALL
George L. Herter, Waseca, Minn., assignor to Herter's, Inc., Waseca, Minn.
Filed Feb. 2, 1972, Ser. No. 222,901
Int. Cl. A63h *2/28*
U.S. Cl. 46—180 **1 Claim**



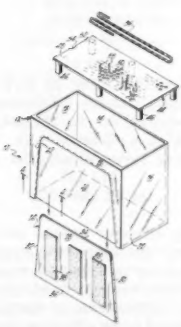
A sound-producing call to simulate the cackling of a pheasant including a call body with an air passage having a reed therein, a bladder attached to the call body, and a slitted diaphragm between the bladder and the air passage of the call body.

3,813,812
SYSTEM FOR OPERATING MINIATURE VEHICLES
Gordon A. Barlow, and Norman Kramer, both of Skokie, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 31, 1973, Ser. No. 328,404
Int. Cl. A63h *29/22*
U.S. Cl. 46—244 R **11 Claims**



A system for operating electrically propelled miniature vehicles along a roadbed having side-by-side current conductive lanes with substantially flush tread surfaces and for remotely controlling the vehicles in a manner to turn out and pass one another at the will of the operator as the vehicles are transferred freely from one lane to another. The vehicles are driven by reversible propulsion motors mounted on the vehicle bodies for operating a pair of rear driving wheels connected by a rear axle. The motor rotates a threaded shaft extending fore and aft of the vehicle body, with a nut threaded on the shaft and operatively associated with front steering wheels to turn the steering wheels in opposite directions depending on the fore or aft movement of the nut in response to opposite rotational movement of the threaded shaft. The reversible propulsion motor is operatively connected to the rear axle through gear trains having oppositely oriented one-way clutches so that the rear wheels are driven by the propulsion motor regardless of the direction of operation of the motor.

3,813,813
WINDOW BOX AND MOUNTING THEREFOR
Charles W. Powell, 227 E. 50th St., New York, N.Y. 10022
Filed Apr. 10, 1972, Ser. No. 242,422
Int. Cl. A01g *9/02*
U.S. Cl. 47—36 **5 Claims**



A transparent container for plants or cut flowers which includes a separate mounting plate for attachment of the container to a generally vertical surface such as a window or mirror. The mounting plate includes pressure actuated mounting means such as double-stick adhesive tape or suction cups. The

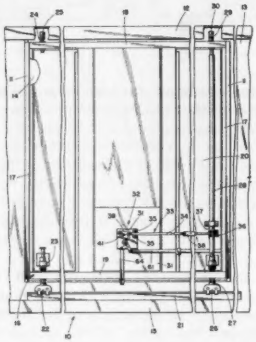
container includes a perforate platform, spaced from the bottom of the container having upstanding supports for cut flowers, and a wick which is placed in a plant support medium for distribution of water stored in a reservoir in the bottom of the container beneath the platform. A self-watering window box results which is maintained in a substantially horizontal position and is easily removed for cleaning and maintenance.

3,813,814

LATERALLY MOVABLE DOOR AND OPERATING MECHANISM THEREFOR

Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Aug. 10, 1973, Ser. No. 387,428
Int. Cl. E05d *15/10*
U.S. Cl. 49—220 **6 Claims**



A railway car door of a type which is laterally movable outwardly from a door opening and slidable to one side thereof includes an improved operating mechanism for moving the door laterally and for locking and unlocking the same. The operating mechanism includes an arm and linkage arrangement actuated in a linear direction by means of a manually operative rotatable member, the said linear movement of the linkage mechanism also actuating bell crank levers having relative lost motion connections which are effective to open and close locking bolts sequentially with respect to the linkage mechanism which is actuated for moving the door laterally relative to the door opening.

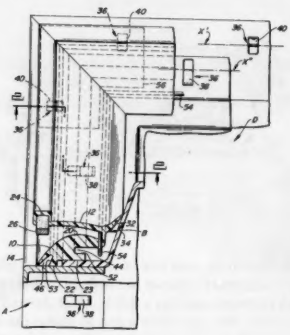
3,813,815

MAGNETIC CLOSURE DEVICES

Max Baermann, Bezirk, Cologne, 506 Benzberg, Germany

Continuation-in-part of Ser. No. 100,634, Dec. 21, 1970, abandoned, which is a continuation of Ser. No. 792,533, Jan. 21, 1969, abandoned. This application Dec. 11, 1972, Ser. No. 313,827
Int. Cl. E06b *7/23*
U.S. Cl. 49—478 **6 Claims**

A self-mounting magnetic closure device for releasably holding and sealing a first element to a second magnetic element, one of the elements defining a movable door and the other of the elements defining a fixed frame having an opening, comprising in combination: an elongated, non-magnetic body member adapted to be affixed to the first element and extending substantially parallel to the edge of the first element; a flexible sealing blade extending out from the body member and having permanently magnetic material adjacent the free end thereof; the first element having a plurality of spaced tabs extending outwardly therefrom in at least one row substantially parallel to the edge of the opening; the tabs having a surface at least in part facing the first element, some of the tabs having free ends defining a line spaced laterally apart from a line defined by the free ends of the other of the tabs; the body member having at least one elongated groove extending the length thereof and a surface adapted to oppose the tab surface, the body member being semi-rigid so that it can be snapped over the tabs.

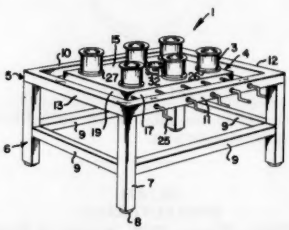


3,813,816

POLISHING APPARATUS

Chris Funk, TraveLodge Junction I-70 & U.S. 283, Wakeeney, Kans. 67672

Filed Dec. 12, 1972, Ser. No. 314,344
Int. Cl. B24b *19/00, 31/06*
U.S. Cl. 51—7 **6 Claims**



A polishing apparatus for polishing particulate material including rocks, stones, gems, and the like by effecting an oscillating and vibrating movement of a platform with at least one container supported thereabove and having the material to be polished therein. The platform is resiliently supported and suspended within a support frame with drive mechanism on said platform for imparting vibratory motion thereto.

3,813,817

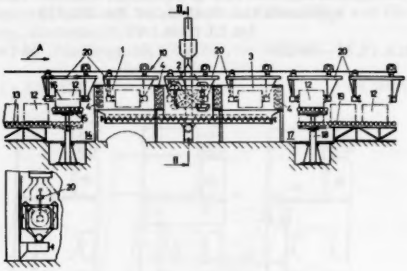
METHOD AND APPARATUS FOR SURFACE TREATMENT OF WORK PIECES

Hans Paul Haberlin, Schaffhausen, Switzerland, assignor to Wheelabrator-Frye, Inc., New York, N.Y.

Filed May 22, 1972, Ser. No. 255,778
Int. Cl. B24c *3/30*
U.S. Cl. 51—15 **9 Claims**

A suspension track — centrifugal blasting machine which includes a suspension yoke having rotatable legs for clamping

blanks and apparatus for rotating the legs with the blanks clamped therebetween during passage through the blasting



area and for a distance beyond the blasting area to effect removal of the blasting media.

3,813,818

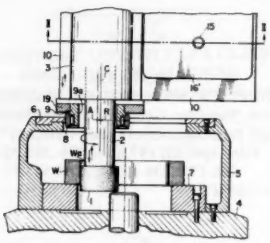
PROFILE GRINDER

Kunihisa Hayashi, and Norihiro Fujimoto, both of Hiroshima, Japan, assignors to Toyo Kogyo Company Limited, Hiroshima, Japan

Filed Oct. 12, 1972, Ser. No. 297,122

Int. Cl. B24b *17/08, 7/00, 9/00*

U.S. Cl. 51—34 A **1 Claim**



A profile grinder including an abrasive grinding wheel adapted to move laterally for controlling the amount of abrasion independently of a follower means located in contact with a template while maintaining the abrasion point aligned with the center of the abrasive wheel along a normal line extending through the point of contact of the follower means on the template, whereby more precise and efficient abrading operation is possible.

3,813,819

HIDE TREATING MACHINES

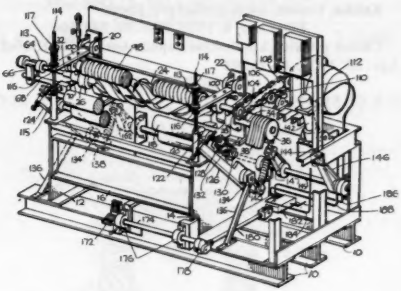
John N. Kokoras, 10 Mortinack Ave., and William N. Kokoras, 44 Linden Rd., both of Peabody, Mass. 01960

Filed June 3, 1971, Ser. No. 149,536

Int. Cl. C14b *1/06*; **B24b** *27/00*; **B24d** *7/02*

U.S. Cl. 51—39 **7 Claims**

The invention is directed to a machine for operating upon wet hides with a helically ribbed abrasive cylinder. The hide is presented to the cylinder on two supporting rolls which are maintained in spaced relationship with the cylinder so that a band of the hide between the rolls is maintained in engagement with the cylinder by the tension supplied solely by the



friction of the hide with the rolls while the hide is being stretched laterally by the action of the helical ribs of the cylinder.

3,813,820

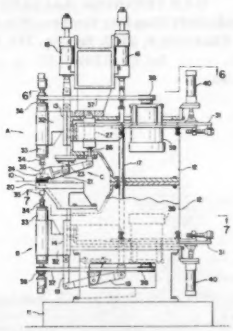
SHEET GLASS CORE DRILLING MACHINE

Carle W. Highberg, and George R. Roesch, both of Sylvania, Ohio, assignors to Englehard Mineral & Chemical Corporation, Murray Hill, N.J.

Filed Mar. 29, 1973, Ser. No. 345,883

Int. Cl. B24b *7/24, 9/08, 9/10*

U.S. Cl. 51—81 **10 Claims**



A machine for drilling through sheets of glass or glass-like material with a pair of opposed cooperating coaxial drilling tools located on opposite sides of the sheet. The tools are alternatingly fed into the sheet to a depth of about half the thickness of the sheet by means of fluid cylinders with pistons connected to the respective drilling tools. The fluid operating system for the cylinders drives each of the pistons at a constant feed rate during both a fast feed interval and a slow feed interval and adjustable timers are used in association with the fluid control system to afford precision control of the depth of cut.

3,813,821

METHOD AND APPARATUS FOR FINISHING THE TOOTH SURFACES OF HYPOID GEARS

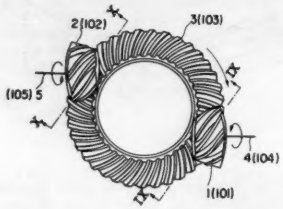
Akira Takahashi, Okazaki, and Masahiro Kuwabara, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Aichi-prefecture, Japan

Filed Apr. 6, 1972, Ser. No. 241,606

Claims priority, applicatioa Japan, Apr. 6, 1971, 46-21231; Apr. 23, 1971, 46-26541

Int. Cl. B24b *39/00*

U.S. Cl. 51—89 25 Claims



A hypoid gear finishing method and apparatus wherein either two hypoid pinion gears or a hypoid ring gear are formed as the tool in a specified shape, the other being rough-cut as the workpiece, the two hypoid pinion gears being opposied to each other and meshed with the hypoid ring gear, and torques in opposite directions are given to the two hypoid pinion gears to rotate these hypoid pinion gears, thereby burnishing the tooth surface of the workpiece gear.

3,813,822

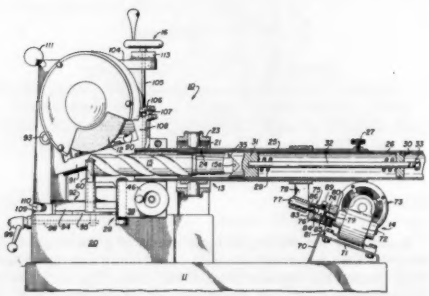
WEB THINNING MACHINE

Theodore Grob, 1549 Ulao Rd., Grafton, Wis. 53024

Filed May 8, 1972, Ser. No. 251,356

Int. Cl. B24b *3/32*

U.S. Cl. 51—90 9 Claims



Web thinning apparatus includes a yoke mounted grinding wheel and motor movable by a lead screw into engagement with the tip of a drill mounted in a clamp and orbited in an elliptical path by an adjustable orbit drive mechanism.

3,813,823

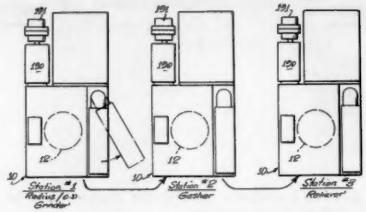
END MILL GRINDER

John Robert Southland, Arcadia, Calif., assignor to Omark-Winslow Aerospace Tool Co., Portland, Oreg.

Continuation of Ser. No. 836,467, June 25, 1969. This application Mar. 7, 1972, Ser. No. 232,520

Int. Cl. B24b *3/06*

U.S. Cl. 51—94 CS 36 Claims



A complete installation is provided for grinding cutters, especially and typically, end mills, by machine controlled operations. The installation has three separate stations which, when all are used, provide maximum flexibility in the shape imparted to the end mill, accuracy of grind, and the ability to repeat or duplicate a particular grind on a series of duplicate cutters. The only manual operations are loading and unloading the end mills at each of the stations; and consequently the grinding of the mill is accomplished rapidly and at low cost.

3,813,824

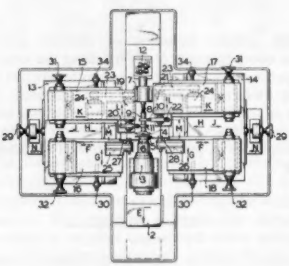
DUPLICATING GRINDING MACHINE

Bruno Smrcek, Neu-Ulm, Germany, assignor to Schiess Aktiengesellschaft, Dusseldorf-Oberkassel, Germany

Filed Apr. 23, 1973, Ser. No. 353,324

Int. Cl. B24b *17/02, 7/00, 9/00*

U.S. Cl. 51—101 R 2 Claims

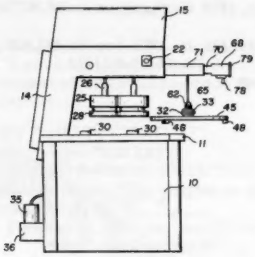


A machine for simultaneously grinding two independently curved surfaces on a single workpiece. The workpiece is rotated between opposed, independently movable carriages, each of which supports a duplicating roll and grinding means. The duplicating rolls respectively trace the contour of a pair of pattern disks rotating relative to the workpiece and through movable mountings cause their respective grinding means to conform to the surfaces of their respective pattern disks.

3,813,825
POLISHING MACHINE OR THE LIKE WITH A REMOVABLE PLATEN

John L. Weber, Spencerport, and George C. Klimas, Rochester, both of N.Y., assignors to Alliance Tool and Die Corp., Rochester, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,423
Int. Cl. B24b 7/00
U.S. Cl. 51—129 8 Claims

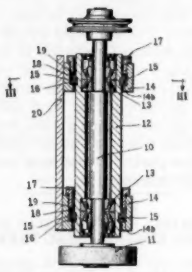


A polishing machine or similar abrading apparatus including a horizontally mounted platen and at least one work support head to locate workpieces on the platen for relative movement therewith. The platen includes a detachable connection, and a hoist mechanism is provided to remove the platen for changing polishing pads or similar operations.

3,813,826
SPINDLE SUPPORT ASSEMBLY IN A GLASS PLATE EDGE GRINDING MACHINE

Sigeru Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd., Tokushima City, Japan

Filed Oct. 26, 1972, Ser. No. 301,211
Int. Cl. B24b 41/00
U.S. Cl. 51—168 5 Claims

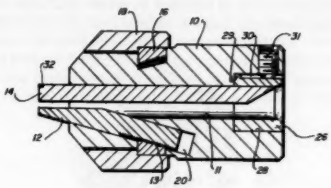


A spindle support assembly in a glass plate edge grinding machine comprises a support member provided on a spindle for a grinding wheel through a bearing, a resilient member fixed to the outer portion of said support member, a holding member adapted to hold said resilient member from the outside thereof, a clamp member disposed between said support member and said holding member, and a friction member inserted between the lower face of said clamp member and the upper face of said resilient member axially opposite to each other.

3,813,827
CHUCK ASSEMBLY

Eric F. Bloch, Orange, Conn., assignor to Eldorado Tool & Manufacturing Corporation, Milford, Conn.

Filed May 25, 1973, Ser. No. 364,149
Int. Cl. B24b 3/24
U.S. Cl. 51—219 R 7 Claims

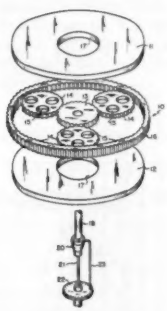


A chuck assembly comprising a body portion including a cylindrical bore and two body recesses obliquely intersecting the cylindrical bore, a pair of jaws including threaded portions located within the recesses, means for conjointly displacing the jaws along and toward and away from the axis of the cylindrical bore from a first advanced position to a second retracted position, a locator independently, slidably axially displaceable along the central bore from a first advanced position whereat the forward end of the locator will be proximate the forward ends of the advanced jaws to a second retracted position whereat the forward end of the locator will be proximate the forward ends of the retracted jaws, means for maintaining the locator at a predetermined radial location, and means for maintaining the locator at a predetermined angular orientation.

3,813,828
METHOD FOR CONTROLLING FINISHED THICKNESS OF PLANETARY-LAPPED PARTS

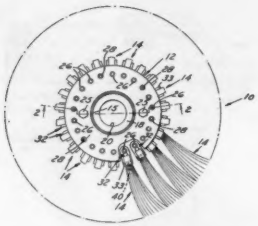
Allan I. Bennett, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 5, 1973, Ser. No. 321,420
Int. Cl. B24b 1/00
U.S. Cl. 51—281 R 4 Claims



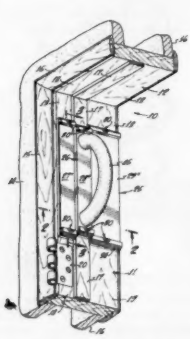
A method for controlling the thickness of a planetary-lapped part prepared by a lapping apparatus having planetary carriers for containing the part which is in gear train with a sun and ring gear and in abrasive engagement with a pair of lapping plates. The method comprises measuring the forces of at least one of the gears during lapping and detecting any increases in those forces and stopping the apparatus upon the detection of said increase.

3,813,829
HUB STRUCTURES
James A. Belanger, Livonia, Mich., assignor to Belanger, Inc., Northville, Mich.
Division of Ser. No. 155,733, June 23, 1971, abandoned. This application Mar. 8, 1973, Ser. No. 339,352
Int. Cl. B24b *9/02*
U.S. Cl. 51—334 **3 Claims**



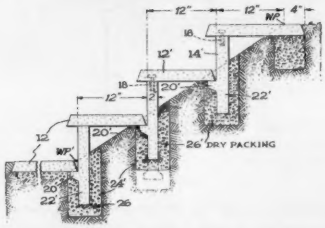
A hub structure for a finishing wheel includes a central axial hub sleeve provided on adjacent opposite axial ends thereof with radially outwardly extending flanges adapted to axially confine a circumferential series of flap-like finishing units in encircling relation to the hub sleeve. Readily releasable means, in the form of a pair of axially extending bolt and nut type connections, are located parallel to and radially outwardly of the hub sleeve and secure one of the flanges in a fixed but removable and replaceable relation to the hub sleeve and the other flange to confine the finishing units therebetween. A circumferential series of mounting pins for the finishing units are secured to the fixed flange of the hub structure radially outwardly of the hub sleeve and of the readily releasable means. The pins axially span the space between the flanges and are adapted to be telescoped by individual finishing units which are replaceable upon the removal of the replaceable flange from the hub sleeve.

3,813,830
DOORFRAME SANDER
Marvin S. Hodge, 421 N. Sunkist, Anaheim, Calif. 92806
Filed Sept. 29, 1972, Ser. No. 293,454
Int. Cl. B24d *15/00*
U.S. Cl. 51—392 **11 Claims**



Apparatus for use in sanding a conventional wooden door frame comprising a base member having three planar sections positioned in parallel, side-by-side relationship, the outer sections being coplanar and the middle section being recessed by the thickness of the doorstop portion of the doorframe, the width of the middle section being slightly greater than the width of the doorstop, the outer sections being equal in length, both ends of the middle section being recessed relative to the ends of the outer sections by an amount equal to the thickness of the doorstop, a pair of clamps connected to the back surface of each section, at opposite ends thereof, for securing the ends of strips of sandpaper which extend along the front surfaces of the sections; and a handle connected to the back surface of the middle section.

3,813,831
PRECAST GARDEN STEPS
John F. P. Tate, 2819 Westhampton Ave. S.W., Roanoke, Va. 24015
Filed July 26, 1973, Ser. No. 382,657
Int. Cl. E04f *11/00*
U.S. Cl. 52—189 **12 Claims**

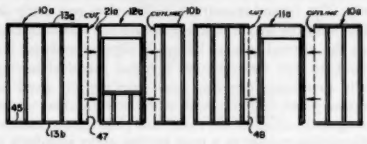


A knock-down precast stairway, preferably for installation on sloping hillsides, made up or precast tread and unique riser elements lending themselves to ridge-and-valley interrelation near the front edge, and an improved deeper set riser contributing to an overall more stabilized installation. The unique, substantially increased overall riser height is preferably approximately twice the finished riser height. It has an integrally formed tread-supporting shelf provided approximately midway the extreme top and bottom edges of each riser element so as to establish a finished step rise of approximately 7 or 8 inches which is normally comfortable. The tread-supporting shelf preferably extends across the full lateral width of the riser element. The riser portion contributing to the added overall height thereof resides in that portion which extends substantially below the tread level, and which lower extended portion is adapted to uniquely set in a preferably relatively fine crushed stone bedding or other suitable trough below the natural terrain surface. The attendant unique installation provides a normally unyielding foundation of increased stability since the bottom edges of the respective riser elements are well below the natural sloping ground surface and are essentially permanently protected from wind and rain erosion as well as most frost upheavals. Any ground engageable portion of the top and bottom treads is also set upon a bed of finely crushed stone and/or packed coarse sand to better protect it against the aforesaid elements.

3,813,832
WALL FRAMING SYSTEM USING PREFABRICATED PANELS
Sidney W. Caplan, Mayfield Village, William N. Molson, Cleveland, both of Ohio, assignors to Component Systems, Inc., Valley View, Ohio
Filed Feb. 1, 1973, Ser. No. 328,788
Int. Cl. E04b *1/00;* **E04g** *21/00*
U.S. Cl. 52—206 **15 Claims**

A system for framing the walls of a building structure using three basic types of prefabricated panels including wall panels, door panels and window panels. The wall panels are dimensionally identical one with another. The window and door panels are provided in a limited number of widths to accommodate a variety of standard window and door frame structures.

Erection of the panels is begun by securing the window and door panels in place atop an existing floor structure. The wall spaces between the door and window panels are then framed



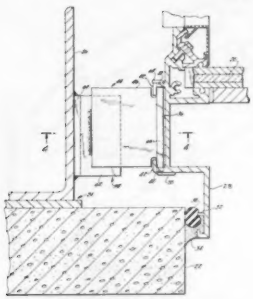
by installing wall panels one at a time, cutting each to length as required. Wall panel scrap is minimized, where practicable, by using each trimmed-off wall panel portion as the next-installed framing component.

3,813,833

WINDOW FRAME STRUCTURE

John S. Dougherty, Miami, Fla., assignor to Allied Products Corporation, Chicago, Ill.

Filed Nov. 9, 1971, Ser. No. 197,014
Int. Cl. E06b *1/12, 1/60*
U.S. Cl. 52—214 **5 Claims**



A window frame structure in combination with a building structure disclosed, the window frame having header, sill and jamb members, and it is integrally joined to the building structure. Means are provided for positioning the frame relative to the structure at a preset elevation by means of a clip member slideably moveable in a guideway positioned along at least one of the jamb members. The clip member is then permanently connected to the structure at a preset elevation whereby the frame may be quickly and accurately located with respect to the structure.

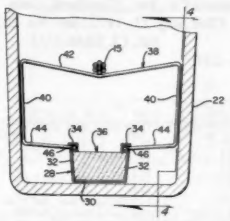
3,813,834

JOIST WITH NAILING STRIP AND POSITIONING MEMBERS

George Bradley Davis, Jr., Boulder, Colo., assignor to Products Engineering, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 41,426, May 28, 1970, abandoned. This application May 24, 1972, Ser. No. 256,257
Int. Cl. E04b *1/41*; E04c *3/18*
U.S. Cl. 52—223 **9 Claims**

A structural element having a fire rating of approximately two hours when tested with the standard time-temperature curve established by the American Standards for Testing Materials, said element including prestressed concrete joists each having a plate-like body portion and one or more integrally formed reinforced support ledges wherein each ledge has a nailing strip integrally molded adjacent the bottom thereof and each nailing strip including a penetratable area formed internally adjacent thereof, a plurality of sheets of material disposed adjacent the ends of said ledges, each sheet of material forming at least one butt joint with an adjacent sheet wherein said butt joint extends longitudinally along a portion of one of said ledges, a plurality of channel-shaped members disposed along each butt joint intermediate said ledge portion and said sheets and attachment means for attaching said channel-shaped members to the nailing strips and, also, for attaching sheets of material to said nailing strips and channel-shaped members whereby said sheets of material are secured to the joist while preventing undesirable distortion or warping thereof during the fire rating tests. This invention also relates to a pretensioned concrete joist of the T-type comprising a concrete plate-like body portion, a channel-shaped support ledge, a nailing strip integrally molded in the bottom of said ledge, said nailing strip including a channel-shaped member having a penetratable layer of material disposed therein and a plurality of positioning members longitudinally spaced along said channel-shaped member, and pretensioning steel extending longitudinally of said ledge and disposed in contacting engagement with said positioning members, said pretensioning steel and said positioning members cooperating to secure and maintain the nailing strip of the bottom surface of the ledge prior to and during placement of the concrete during forming of said joist. This invention also relates to a novel form member for producing a pretensioned concrete member having a nailing strip molded therein, and to a novel positioning member made from a single piece of plastic material.

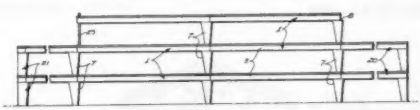


3,813,835

MODULAR MULTIPLE STORY STRUCTURE AND MODULE THEREFOR

Edward K. Rice, 14656 Oxnard St., Van Nuys, Calif. 91401

Filed May 30, 1972, Ser. No. 257,690
Int. Cl. E04b *1/343*; E04c *3/20*; E04b *1/348*
U.S. Cl. 52—227 **11 Claims**



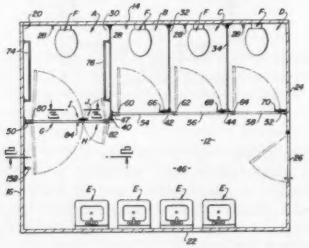
A modular multiple story structure which utilizes, as its principal component, a module formed of an elongated reinforced precast slab of concrete having an integral single leg or column at one end only, the leg having a haunch or shoulder at one side to support the end of another module in axial alignment; the modules being arranged for placement side-by-side as well as end-to-end and capable of being stacked with the legs in vertical alignment to form vertical columns of a multiple story structure. Removable legs are provided for each module, at its end opposite from the integral leg, to facilitate installation. The modules may be spaced laterally to receive

and support leg free slab modules which may be cast in place or precast. The modules forming each floor are provided with a set of tendon guideways extending in one horizontal direction and may include a second set of guideways disposed in alignment. The horizontal and vertical guideways receive tendons which are capable of being tensioned then secured under tension to place the concrete modules under compression. Selected modules may be modified, such as disposing their slabs at an incline and changing their legs or columns to form ramps for connecting the floors formed by the other modules.

3,813,836
TOILET COMPARTMENT FOR PHYSICALLY HANDICAPPED

Harold J. Dielman, Lyndhurst, Ohio, assignor to The Sanymetal Products Co., Inc., Cleveland, Ohio

Filed Aug. 21, 1972, Ser. No. 282,373
Int. Cl. E04h *1/12*
U.S. Cl. 52—239 **1 Claim**

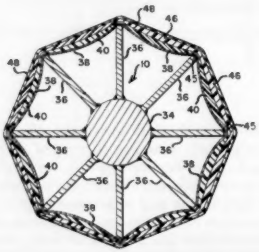


A special toilet compartment for physically handicapped persons is wider and deeper than a standard toilet compartment. The special compartment has an entrance opening which is closable by two individual doors hingedly mounted on vertical axes on opposite sides of the entrance opening. A first of the doors is mounted for swinging movement outwardly of the compartment. A second of the doors is substantially narrower than the first door, and is mounted for swinging movement either inwardly or outwardly of the compartment.

3,813,837
FIBERGLASS POLE AND METHOD AND APPARATUS FOR FABRICATING SAME

Stephen A. McClain, Puyallup; Harvey A. Doman, Tocoma, and Richard D. Entus, Gig Harbor, all of Wash., assignors to Cascade Pole Company, Tacoma, Wash.

Filed Oct. 16, 1972, Ser. No. 298,028
Int. Cl. E04c *3/30*
U.S. Cl. 52—309 **12 Claims**

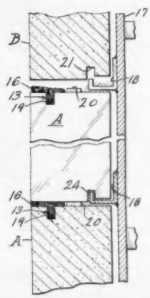


A hollow resin bonded glass fiber column of unique cross section suitable for use as a utility pole, light standard or the like is disclosed including unique means for forming the pole. A rotatable finned mandrel is wrapped with a waxed surfaced paper and then sprayed with a mixture of chopped glass, resin and catalyst which is initially pressed thereon by a roller and then wrapped with continuous bands of fiberglass roving, rerolled, covered with a fiberglass veil, rolled again and allowed to cure. The finned mandrel which makes relatively thin line contact with the inside of the pole and the wax surfaced paper allows the curved pole to be easily slipped endwise from the mandrel. In one embodiment a metal mandrel having eight radially extending fins has been successfully used to form fiberglass poles of octagonal cross section. The intermittent pressing and rolling of the resin and glass on the mandrel during formation produces a pole having eight angularly distinct surface panels with planar outer surfaces and inner surfaces which are arcuately bowed toward the center of the pole such that the thickness of each of the panels varies across its width to provide an exceptionally strong pole. Base members and lateral support arms for use in conjunction with the poles are also disclosed.

3,813,838
BUILDING CONSTRUCTION GASKET

Howard R. Brown, Rt. 3, Box 67B, Sand Ridge Rd., Bowling Green, Ohio 43402, and Owren J. Aftreth, 30 Spring Ln., P.O. Box 194, Chappaqua, N.Y. 10514

Filed Apr. 24, 1972, Ser. No. 246,998
Int. Cl. E04b *1/66*
U.S. Cl. 52—396 **1 Claim**



A resilient gasket for use as a weather seal between adjacent blocks in a wall construction in place of conventional caulking. The gasket has a cross-sectional configuration designed for use within a block joint having a single recessed channel on one block for positioning the gasket and has a thickness or depth, when uncompressed, larger than the joint width. Installation will provide a weathertight seal between the adjacent blocks which has an attractive visual appearance.

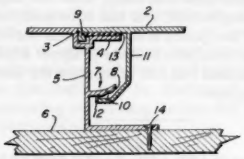
3,813,839
DECK ASSEMBLY

Eric Simpson, Jr., Sepulveda, and Morton Fried, Mountain Valley, both of Calif., assignors to Martin Marietta Aluminum Inc., Washington, D.C.

Filed Aug. 14, 1972, Ser. No. 280,109
Int. Cl. E04c *1/30*
U.S. Cl. 52—588 **7 Claims**

A deck assembly is described whereby each of at least two substantially identical modules include a panel, said panel having a portion thereof defining a groove adjacent to one edge of the panel; a plurality of ribs depending from the panel, one of the ribs carrying a flange having a locking notch or groove; a tongue extending along another edge or end of the

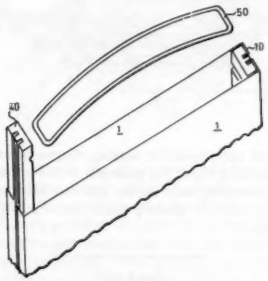
panel, a lip extension extending outward from the portion of the panel defining the groove. The two modules may be interlocked together with a sealing strip interposed between the lip extension and the panel to provide a unitary platform, roof or cover.



3,813,840
CONSTRUCTIONAL ELEMENT

Katharina Wagenknecht, nee Hissbach, 9, Wulachstrabe, D-75 Karlsruhe 51, Germany

Filed Sept. 23, 1971, Ser. No. 183,114
Claims priority, application Germany, Sept. 26, 1970, 2047410
Int. Cl. EO4b *1/00*; **EO4c** *2/00*
U.S. Cl. 52—619 **19 Claims**

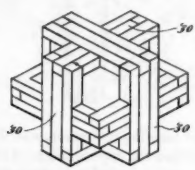


A constructional element the form of which is suitable for use in buildings, internal fittings, furniture, and packaging which includes a thin walled component and filler component with the thin walled component having guide strips on two opposite edges with which the filler component is engaged.

3,813,841
CUBOIDAL STRUCTURES

Sukeo Tsurumi, 55 Syokusan, Najio, Siyoze, Post No. 669-11, Nisinamiya, Hiyogo, Japan

Filed Nov. 18, 1971, Ser. No. 200,081
Claims priority, application Japan, June 25, 1971, 46-45692; June 25, 1971, 46-45693
Int. Cl. E04h *1/12*
U.S. Cl. 52—648 **3 Claims**

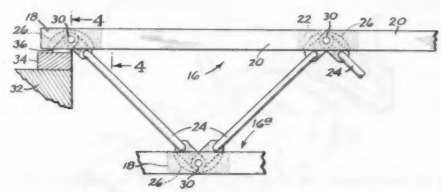


The present invention relates to the assembling matters such as blocks which are solid and stout and have excellent fittability or joinability to one another, such matters being capable of forming face plates of perfectly same configuration adapted to constitute the respective sides or faces of a six-sided cubic structure which can be easily assembled or disassembled and which can be utilized for a variety of purposes such as for building, construction, many types of utensiles, structures, toys and so forth.

3,813,842
LAMINATED, VARIABLE DENSITY, STRUCTURAL WOOD PRODUCTS AND METHOD FOR MAKING THE SAME

Arthur L. Troutner, Boise, Idaho, assignor to Trus Joist Corporation, Boise, Idaho

Continuation of Ser. No. 867,184, Oct. 17, 1969, abandoned.
This application Apr. 26, 1972, Ser. No. 247,897
Int. Cl. E04c *3/14*
U.S. Cl. 52—693 **2 Claims**

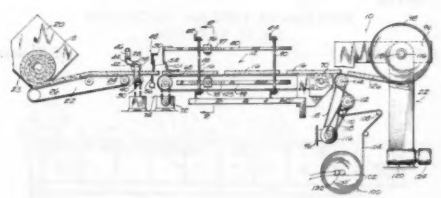


Trusses and other structural products are made by applying glue to the side faces of a plurality of thin strips of wood, stacking the strips flatwise onto two adjacent stacks whereof the adjacent ends are interleaved, and applying across the surfaces of the stacks, in a direction substantially normal to the planes thereof, presure sufficient to consolidate the interleaved portion to the thickness of the remaining portion and to apply to both portions clamping pressure sufficient adhesively to unite the strips by setting of the glue interfaces therebetween. This forms an integral structural product having portions of normal density and strength and portions of increased density and strength useful as points of connection and bearing.

3,813,843
METHOD AND APPARATUS FOR ROLLING CUT FILTER PAD

James E. Wooldridge, Madison, and Ronald P. Martin, New Albany, both of Ind., assignors to Wehr Corporation, Milwaukee, Wis.

Filed June 9, 1972, Ser. No. 261,413
Int. Cl. B65b *63/04*
U.S. Cl. 53—21 FW **15 Claims**



Cut filter pads are delivered to a roll station where kraft paper is drawn from a free-wheeling supply roll and threaded through a series of idler rolls and driven feed rolls to a driven take-up roll. From the last of the driven feed rolls the kraft

paper has a generally horizontal extension to the take-up roll onto which the cut filter pads are discharged. The filter pads move with the paper into the take-up roll where the pads are compressed between adjacent layers of the paper as it is wound onto the take-up roll. When a given number of cut pads have been wound into the take-up roll, the roll station is stopped, the paper cut, and the roll closed by taping the cut end to the roll paper.

3,813,844

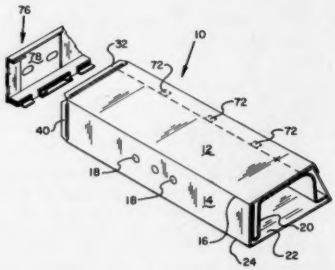
METHOD FOR FORMING PACKAGE

Everett A. Coons, West Monroe, La.; Lewis D. Poggiali, and Richard P. Jacalone, both of Owosso, Mich., assignors to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 223,582, Feb. 4, 1972, Pat. No. 3,757,935. This application May 25, 1973, Ser. No. 363,948

Int. Cl. B65b *1/02*

U.S. Cl. 53—32 **3 Claims**



An improved bathtub shipping package for completely encircling the bathtub to protect the bathtub from rough handling and the elements of weather. The package comprises a wrap-around tube member having a pair of unique end caps fixedly attached to the tube member, the end caps having built in means for reinforcing the end caps from horizontal and vertical shock as well as built in protective pads for protecting the top end portions of the bathtub whenever the bathtub is placed within the package. The structural manufactured joint for the tube member is formed at the bottom rear of the tube which serves to cushion the rear legs of the bathtub whenever the bathtub is placed within the package. The end caps are positioned within the tube in combination with the structural manufactured joint so that longitudinal stapling of the end caps to the tube member is easily accomplished due to the resistance of the structural manufactured joint.

3,813,845

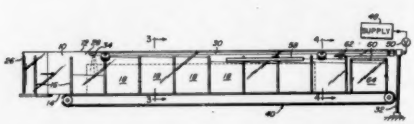
FILLING AND SEALING SYSTEM

Roy J. Weikert, c/o General Films, Inc., Covington, Ohio 45318

Filed June 23, 1972, Ser. No. 265,769

Int. Cl. B65b *1/04*

U.S. Cl. 53—37 **35 Claims**



A web of bag blanks, a method of making the web, and apparatus and method for filling and sealing the bags in the web. The web is formed as a continuous tube having spaced, transverse seal lines extending from a lower edge of the web to a point short of the upper edge. The bags are filled and sealed on a machine having an elongated filling pipe which is threaded into the tube between its upper edge and the upper ends of the transverse seal lines. After the bags are filled, a continuous, longitudinal, seal line is formed, intersecting the upper ends of the spaced seal lines to seal the filled bags. The tube is then severed intermediate its upper edge and the continuous longitudinal seal line to separate the filled, sealed bags from the filling pipe.

3,813,846

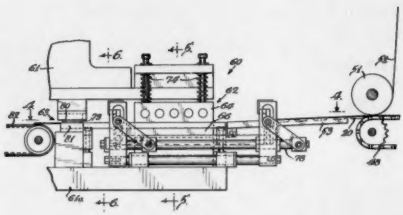
METHOD AND APPARATUS FOR SEALING THERMOPLASTIC COVERS TO TRAYS

Henry H. Doering, Jr., Hinsdale, Ill., assignor to C. Doering & Son, Inc., Chicago, Ill.

Division of Ser. No. 193,081, Oct. 27, 1971, Pat. No. 3,768,228, which is a continuation of Ser. No. 888,186, Nov. 26, 1969, abandoned. This application May 16, 1973, Ser. No. 360,841

Int. Cl. B65b *7/28, 51/14*

U.S. Cl. 53—39 **5 Claims**



Method and apparatus for sealing thermoplastic covers to product containing trays; for example in the embodiment disclosed for converting bulk butter and the like into individual service patties and for sealing each pat in a totally enclosed sanitary server.

3,813,847

CONTAINER FILLING AND PRODUCING MACHINE

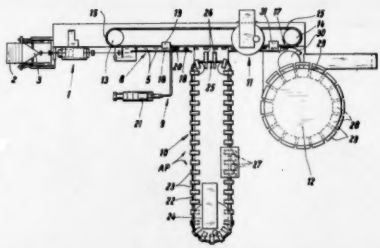
Paul Kuhnle, Winnenden Wurttemberg, Germany, assignor to Fr. Hesser Maschinenfabrik AG, Stuttgart, Germany

Filed Sept. 25, 1972, Ser. No. 291,676

Claims priority, application Germany, Sept. 24, 1971, 2147660

Int. Cl. B65b *31/02, 43/30*

U.S. Cl. 53—112 B **6 Claims**



An apparatus for forming containers and filling the same, in which there is provided the improvement of container conveying means which are adapted to angularly displace open mouth containers. The container conveying means is associated with first and second filling means for, respectively, measuring liquids and metering lump or agglomerated materi-

al (such as foodstuffs). The second filling means includes a metering device and an endless chain angularly arranged relative to the container conveying means, and which mounts a plurality of troughs or the like pivotable about axes parallel relative to their direction of travel. In this way, when the troughs are tilted or angled, during their travel at the point where they are associated with open and angularly displaced containers, the foodstuffs may be discharged into the containers. An evacuating and closing device may be associated with the container conveying means.

3,813,848

INCOHERENT PRODUCT VOLUMETRIC BATCHING DEVICE FOR HIGH SPEED PACKAGING MACHINES

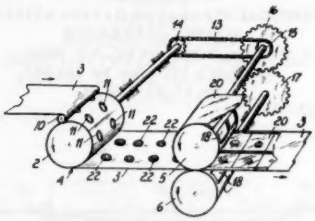
Andrea Romagnoli, Lazzaro, Italy, assignor to Industria Macchine Automatiche S.p.A., Ozzano Emilia, Bologna, Italy

Filed May 13, 1971, Ser. No. 143,050

Claims priority, application Italy, May 16, 1970, 3452/70

Int. Cl. B65b *9/02*

U.S. Cl. 53—178 **2 Claims**



An improved device for dispensing volumetric batches of incoherent products, particularly for high speed packaging machines, comprising a dispensing drum with horizontal axis of rotation, having peripherally distributed batching recesses, a product feed hopper associated with the dispensing drum, means for the entrainment of the packaging band from which the envelopes for the product batches are formed and which is maintained in contact with the surface of the dispensing drum without slipping on it.

3,813,849

MACHINE FOR PACKAGING ELONGATED ARTICLE

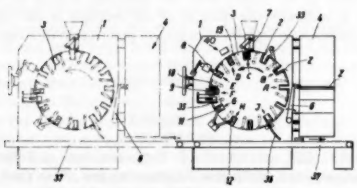
Adolf Stambera, Stuttgart-Bad Canstatt, and Rolf Leich, Stuttgart, both of Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany

Filed May 17, 1972, Ser. No. 254,016

Claims priority, application Germany, May 18, 1971, 2124489

Int. Cl. B65b *11/32*

U.S. Cl. 53—234 **12 Claims**



An automatic packaging machine for macaroni, or the like, in which the machine includes a vertically disposed, rotatable conveyor wheel with adjacently arranged stations for filling, weighting, sealing and closing. The wheel has pockets in the periphery for receiving packaging material and the articles to be packed. Associated with the wheel are folding and closing mechanisms for effecting individual steps of the operation. A parallel disposed conveyor feeds blanks to the wheel.

3,813,850

OIL RECOVERY METHOD FOR DISPLACEMENT ROTARY AIR COMPRESSOR

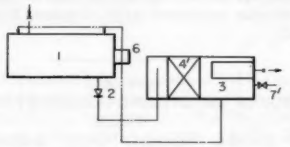
Eiichi Uratani, Tokyo, Japan, assignor to Sumida Equipment Industries, Inc., Tokyo, Japan

Filed Sept. 1, 1972, Ser. No. 285,872

Claims priority, application Japan, Mar. 29, 1972, 47-30686

Int. Cl. B01d *53/14*

U.S. Cl. 55—29 **7 Claims**



The turbine oil used in a screw-type air compressor as a lubricant and sealant is mixed with approximately 40 percent trichlorofluoromethane, trichlorotrifluoroethane, or dichlorotetrafluoroethane to raise the specific gravity of the mixture above that of water. When the compressed air discharged from the compressor is cooled, moisture condenses and the entrained droplets of the oil mixture are precipitated and settle under the aqueous condensate so that the latter may be removed by overflow while the oil mixture may be returned to the compressor.

3,813,851

PROCESS AND APPARATUS FOR AT LEAST PARTLY REMOVING BY GRAVITY A PARTICULATE COMPONENT FROM A LIQUID DISPERSION

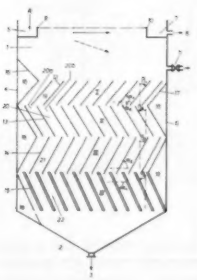
Theodor Eder, Vienna, Austria, assignor to Aspanger Kaolin- Und Steinwerke Aktiengesellschaft, Vienna, Austria

Filed Dec. 14, 1971, Ser. No. 207,773

Claims priority, application Austria, Dec. 15, 1970, 11285/70

Int. Cl. B01d *19/00, 21/00*

U.S. Cl. 55—52 **31 Claims**



A feed mixture is provided which comprises a liquid and a particulate component which is dispersed in said liquid and differs in specific gravity from said liquid. Said feed mixture is treated in a plurality of successive stages, each of which comprises a plurality of substantially identical separating spaces

defined by inclined collecting surfaces. The particulate component is collected on said collecting surfaces and caused to travel along each collecting surface and from the collecting surfaces of each preceding stage to the collecting surfaces of the next succeeding stage along a predetermined path of travel. The liquid is caused to flow in said separating spaces and from each space along a predetermined liquid flow path, which is separated spaced from said path of travel. Said collected particulate component is withdrawn from the collecting surfaces of each stage in a first withdrawal area. The liquid is withdrawn from the separating spaces of each stage in a second withdrawal area, with is separated from said first withdrawal area. The angle between the horizontal components of the velocity of travel of the collected particulate component along said path of travel is changed by at least 90L as said collected particulate component is transferred from the collecting surfaces of each preceding stage to the collecting surfaces of the next succeeding stage so that said path of travel between successive stages is spaced from said liquid flow path.

3,813,852

METHOD OF RECOVERING FLUORINE FROM WASTE GASES

Fredrik Steineke, Vagsbygd, Norway, assignor to Elkem-Spigerverket A.S., Oslo, Norway

Filed Mar. 19, 1973, Ser. No. 342,730
Claims priority, application Norway, Mar. 22, 1972, 943/72
Int. Cl. B01d *19/00*
U.S. Cl. 55—71 **8 Claims**

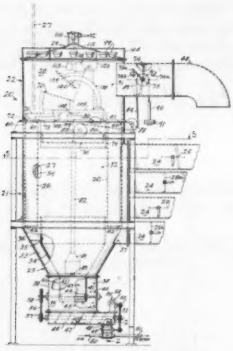
Fluorine from waste gases is recovered by contacting the gases with aluminum oxide in the presence of steam. The steam increases the adsorption rate of the aluminum oxide thereby improving fluorine recovery.

3,813,853

DUST FILTER

Robert J. Anderson, Toledo, Ohio, assignor to The Andersons, Maumee, Ohio

Filed Aug. 30, 1971, Ser. No. 175,936
Int. Cl. B01d *46/04*
U.S. Cl. 55—96 **7 Claims**



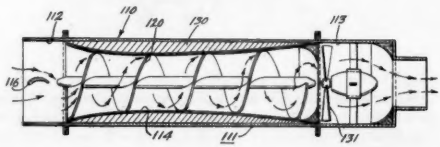
A dust filter having a housing that is divided by a horizontal partition into an upper clean gas plenum and a lower contaminated gas plenum. A circumferentially extending plurality of vertical, parallel cells are located in the lower plenum and their upper ends open through the partition into the clean gas plenum. The lower ends of the cells are closed and each contains one or more filter bags which have closed tops and lower ends which open through the closed ends of the cells to the lower contaminated gas plenum. At the lower end of the housing there are two concentric, spaced conical hoppers leading downwardly to dust discharge mechanism. The lower ends of the cells extend below the level of the top of the inner hopper. One or more pressurized contaminated gas ducts lead into the lower plenum. An exhaust duct equipped with a damper leads from the clean gas plenum to atmosphere. A damper actuating device located in the contaminated gas plenum is responsive to the differential between the pressure in the contaminated gas plenum and atmosphere for opening and closing the damper to maintain a substantially constant pressure in the contaminated gas plenum. A clean gas blast generator functions to deliver an impact to a pre-determined volume of clean gas including the gas in one of the cells and a measured volume of clean gas placed in communication with the cell to be cleaned. The blast passes the measured volume of clean gas through the bag or bags in the cell being cleaned for expelling accumulated dust from the cell downwardly into the annular space between the hoppers.

3,813,854

CENTRIFUGAL SEPARATOR HAVING AXIAL-FLOW VORTEX GENERATOR

Norman A. Hortman, Brick Yard Rd., N.J. 08560

Filed July 7, 1972, Ser. No. 269,607
Int. Cl. B01d *45/04*
U.S. Cl. 55—399 **4 Claims**



In a centrifugal separator having a hollow cylindrical casing with coaxial inlet and outlet zones through which a particle-laden medium is flowed, airfoil means is provided in the inlet zone for creating a vortex in the casing to separate the particles from the medium. The airfoil extends radially into the inlet zone and has a leading edge facing upstream and a tip located centrally in the flow stream. As the medium flows at a high velocity across the airfoil a vortex is generated downstream of the tip and in the casing. A layer of porous material lines the inside of the casing to capture the particles which are separated from the medium by the centrifugal action of the vortex. A continuous helical vane extends between the inlet and the outlet to channel the swirling fluid in a helix as it flows through the casing. In one embodiment, a venturi-shaped insert is provided in the casing and an axial-flow fan is provided in the outlet zone for inducing a draft in the inlet zone to maintain the velocity of the medium in the inlet zone at a sufficiently high level to ensure generation of a vortex.

3,813,855

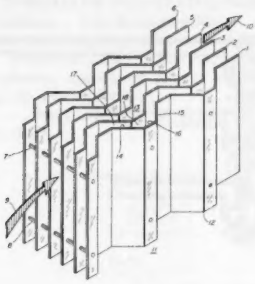
SEPARATOR

Ernest C. Hill, and Charles T. Patterson, both of Tulsa, Okla., assignors to Combustion Engineering Inc., New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,223
Int. Cl. B01d *45/08*
U.S. Cl. 55—440 **1 Claim**

A group of parallel plates are arranged to be mounted in a shell. The plates are shaped to form a series of interlocking trapezoidal ribs in the direction of flow of a fluid stream

between the plates. The plates are arranged relative to each other to register the ribs in the parallel plates so they nest



within each other. The result is a flow path of serpentine shape in which impact and sheltered liquid flow takes place to separate liquid from the flow stream.

3,813,856

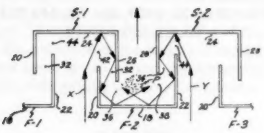
AIR CLEANSING UNIT

Donald D. Jensen, 1141 Park Circle Dr., Fresno, Calif. 93727

Filed Nov. 24, 1972, Ser. No. 303,275

Int. Cl. B01d *45/06*

U.S. Cl. 55—444 **6 Claims**



A unit which when disposed substantially transversely relative to the direction of flow of a current of air containing entrained fine particles removes the major portion of such particles as the current of air flows therethrough. The unit is not limited to but is particularly effective in removing grease particles from a current of air moving upwardly at a substantial velocity from a range, broiler or the like, prior to the air entering a duct system for discharge to the ambient air atmosphere.

In addition to serving the above functions, the unit also acts as a barrier to prevent a flame resulting from a flareup on the range or broiler initiating a fire in the duct system, which system may have a film of highly combustible material on the interior surface thereof.

The unit includes no moving parts, may easily be cleaned, and so operates that collected grease has no tendency to leak back to the cooking surface. The current of air flowing through the unit is subdivided into a number of pairs of air streams. The first and second air streams that define each pair are caused to travel through the unit at different velocities. By bringing the first and second air streams of each pair together prior to discharge from the unit, the entrained particles are subjected to a centrifugal force that flings them against the interior surfaces of the unit, and the major portions of the particles adhering thereto rather than being discharged outwardly from the unit to the ambient atmosphere.

When the air current is warm and contains grease particles, the collected grease particles will coalesce to define a liquid grease, which liquid grease as it forms tends to flow downwardly in the unit to a suitable trap if the unit is transversely disposed in the air current at a substantial angle. Due to this continuous removal of collected grease, the velocity of air flow through the unit is easily controlled, and the balance of the ventilation system maintained at a substantially constant value.

3,813,857

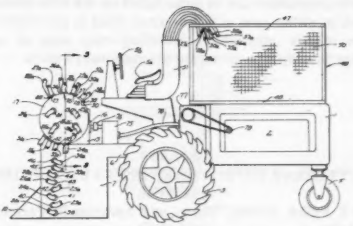
COTTON HARVESTER

Herbert A. Harrington, Cincinnati, Ohio, assignor to HMR Enterprises, Inc., Cincinnati, Ohio

Filed Oct. 12, 1972, Ser. No. 296,753

Int. Cl. A01d *45/20*

U.S. Cl. 56—13.1 **31 Claims**



A pneumatic apparatus for picking cotton and the like comprising a spaced pair of vertical panels adapted to lie on either side of a cotton plant in a row thereof; each of the panels having a plurality of cotton intake openings therein. The apparatus includes a pump of suitable type having a plurality of inlet ports and a plurality of outlet ports. Means are provided for connecting the cotton intake openings in the vertical panels to the inlet ports of the pump and additional means are provided for connecting the outlet ports of the pump to a cotton receiving and storing means. The pump operates in such a way as to produce alternate vacuum and pressure pulses having an air velocity of from one half the speed of sound to the speed of sound through the intake openings and inlet ports. The momentary vacuum pulses will cause cotton to be extracted from the plant and to be conducted to the pump through the intake openings in the panels and through the inlet ports in the pump. The pressure pulses will cause the cotton to pass from the pump, through the outlet ports therein, to the cotton storage and receiving means. Means are also provided for moving the assembly along a row of cotton plants. Further means may be provided to support the cotton plants in a substantially upright position during the picking operation.

3,813,858

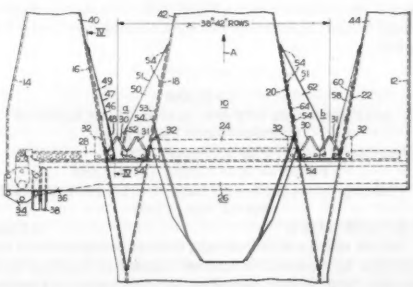
ADJUSTABLE CORN HEAD

William C. McDermott, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 5, 1973, Ser. No. 338,354

Int. Cl. A01d *45/02*

U.S. Cl. 56—119 **4 Claims**



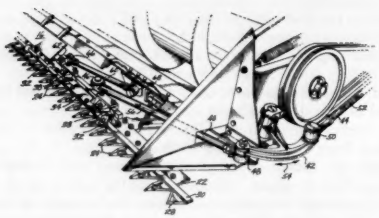
This disclosure relates to an improvement in corn heads for a forage harvester and provides a first pair of asymmetrical stationary knives coacting with a moving cutter knife for

directing and severing stalks and wherein a second pair of knives can be substituted for said first pair of knives to direct stalks to a different portion of said moving cutter knife thereby permitting the forage harvester and/or towing tractor to be shifted laterally to keep one or both from running on a harvested row. A further part of this disclosure relates to a two-row corn head and with the use of a first asymmetrical pair of stationary cutting knives and a dissimilar asymmetrical pair of knives which can be substituted for the first asymmetrical pair in either row, a simple corn head is provided which can be readily adjusted for handling crop rows of various spacings by simply re-arranging the stationary knives.

3,813,859
CUTTERBAR IMPROVEMENTS IN A HARVESTING MACHINE

Harry S. Fuller, Amboy, Minn., and Ambrose H. Partch, Garfield, Wash., assignors to J. E. Love Company, Garfield, Wash.

Filed Oct. 13, 1972, Ser. No. 297,433
Int. Cl. A01d *55/26*
U.S. Cl. 56—260 **3 Claims**



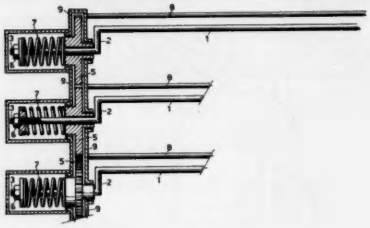
An elongated stiffener is provided along a portion of the rear edge of a barback. A ball joint connects one end of a barback brace rod to the inner end of the stiffener. Both the brace rod and the stiffener extend from the ball joint generally towards a drive rod for a sickle which is mounted on and extends forwardly from the barback. The stiffener is located behind and extends between a pair of guide blocks on the barback which receive and guide a moving guide bar which is a part of the sickle drive. The barback stiffener is about the same thickness as the barback and is about one-half the width of the barback. It adds section modulus to the barback in a region of the barback which without such extra section modulus would be bent by forces imposed on it by the drive rod for the sickle.

3,813,860
MACHINE FOR THE MECHANICAL PICKING OF OLIVES FROM THE TREE

Remo Cecchi, 36-W. 40th St., Foggia, 10018

Filed Nov. 3, 1972, Ser. No. 303,559
Claims priority, application Italy, Nov. 10, 1971, 11804/71
Int. Cl. A01g *19/08*
U.S. Cl. 56—328 R **2 Claims**

All the olives are picked from the tree, irrespective of their ripeness, by means of a machine capable of exerting an adjustable force without damaging the leaves and the branches. This machine comprises a plurality of extended teeth, mounted parallel one another on a common support and each adapted to follow a curved path of which the tooth is the generating line. In the illustrated embodiment the teeth are crank-shaped and are driven through their end which is offset with respect to their elongated portion. There are preferably

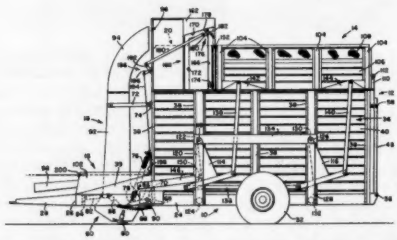


provided devices for preventing the jam of all the teeth and, alternately with, and parallel to the movable teeth, a plurality of stationary teeth.

3,813,861
MOBILE STACK-FORMING IMPLEMENT

William Robert Wood, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 26, 1973, Ser. No. 344,712
Int. Cl. A01d *87/10*
U.S. Cl. 56—344 **10 Claims**



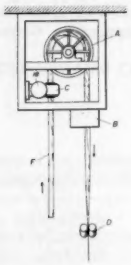
A stack-forming implement including a mobile frame, a container on the frame, a crop pickup unit on the frame forwardly of the container operative to pick crop material up off the ground and discharge it upwardly and rearwardly into the container, a top for the container reciprocable vertically between raised and lowered positions for compressing the crop material in the container, the front end of the top having a deflector member mounted thereon for vertical pivotal movement between a raised deflecting position and a lowered compressing position, and means for selectively maintaining the deflector in either its raised or lowered position as the top is lowered to compress the crop material in the container, the deflector in the former position being operative to deflect crop material being discharged rearwardly into the container downwardly into the front portion thereof while the material in the rear portion of the container is being compressed by the top, and the deflector in the latter position being operative to compress the material in the front portion of the container simultaneously as the material in the rear portion of the container is being compressed by the top.

3,813,862

APPARATUS FOR DETECTING AND CORRECTING TORSION OF TRAVELLING FABRIC

Isamu Tsuchida, 1-24-Koazahiroshiki, Azaooyamasaki, Ooyamaski-cho, Otokuhi-gun, Kyoto-fu, Japan

Filed Mar. 27, 1973, Ser. No. 345,352
Claims priority, application Japan, Mar. 31, 1972, 47-32991; Apr. 20, 1972, 47-46813
Int. Cl. D06c *29/00*; G01l *5/00*
U.S. Cl. 57—1 UN 7 Claims



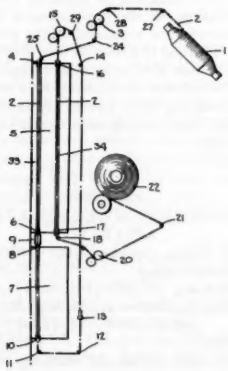
An apparatus comprising a detecting unit for detecting the torsion of a travelling fabric and a correcting unit for correcting the torsion detected by the detecting unit. The detecting unit has a working surface for detecting operation positively driven in sliding contact with the surface of the fabric longitudinally thereof. The positive sliding motion of the working surface assures the detection of the torsion of the fabric with high sensitivity and accuracy to permit the correcting unit to correct the torsion with greatly improved efficiency.

3,813,863

APPARATUS AND PROCESS FOR CONTINUOUSLY TEXTURING AND POST-SETTING YARNS

Helmut Ritter, Wattwil, Switzerland, assignor to Heberlein & Co., AG, Gall, Switzerland

Filed Oct. 30, 1972, Ser. No. 302,476
Claims priority, application Switzerland, Oct. 29, 1971, 15797/71; June 14, 1972, 8884/72
Int. Cl. D01h *13/28*, *7/92*; D02g *1/02*
U.S. Cl. 57—34 HS 11 Claims



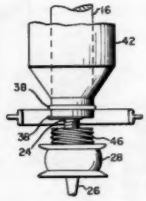
Apparatus and process for continuous treatment of yarn wherein the yarn is passed through several heating devices, is false-twisted, and is again passed through at least one of the heating devices to reduce its elasticity.

3,813,864

METHOD FOR STRINGING UP A ROTATING PACKAGE HOLDER

Stanley Robert Cochran, Martinsville, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 29, 1972, Ser. No. 310,461
Int. Cl. D01h *9/16*
U.S. Cl. 57—34 TT 2 Claims



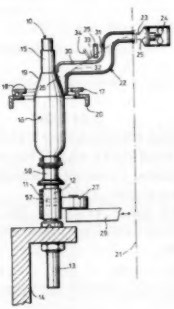
A method for stringing up a rotating package holder on a ring twister without stopping the yarn or package holder is accomplished by use of a waste spool of a diameter less than that of the package holder and selected to give a surface speed about the same as the yarn feed speed.

3,813,865

APPARATUS FOR THE PICKUP OF THREAD ENDS FROM A BOBBIN

Kurt Hohloch, Ebersbach, Germany, assignor to Zinser-Textilmaschinen GmbH, Ebersbach, Germany

Filed Apr. 5, 1973, Ser. No. 348,046
Int. Cl. D01h *13/14*
U.S. Cl. 57—34.5 16 Claims



What follows is a description of an improved apparatus for use in a spinning machine for the pickup of thread ends formed by thread breakage. The spinning machine includes at least one spinning station formed essentially of a rotatably mounted spindle and a spool mounted on the spindle. The spool has a thread wound thereon to form a bobbin. The apparatus associated with the spinning machine has a vacuum source, a suction mouthpiece connected to the vacuum source and positioned to lie opposite the bobbin and a drive for reversing the direction of rotation of the spindle after a thread breakage. The apparatus has been improved in order that the reverse rotation of the spindle is carried out at a sufficiently high rotational speed so that the rotational speed and the air stream resulting therefrom act on the thread end and effectively either cause or aid in causing the separation of the thread from the bobbin.

3,813,866

GRIPPING MEANS FOR DOFFING YARN PACKAGES

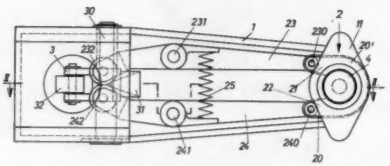
Georg Goldammer, Friedrichshofen; Eberhard Grimm, Ingolstadt, and Emil Egli, Windisch, all of Switzerland, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Jan. 31, 1972, Ser. No. 221,864

Claims priority, application Germany, Feb. 5, 1971, 2105344

Int. Cl. D01h 9/08

U.S. Cl. 57—52 2 Claims



Yarn packages wound on tubes by ring spinning machinery are doffed by an arm which is lowered until a ring carried thereon encircles the tube end portion. The ring has a gap and the two free ring ends are positively moved toward each other across the gap to contract the ring to embrace the tube. A separate lever arm is connected to each ring free end. The two levers are disposed substantially parallel and are normally wedged apart to maintain the ring ends in spread condition to receive a tube. Electromagnetic drive means effect movement of the levers together to contract the ring and grip a tube end. After the arm is raised, the levers are spread to release the tube and a plate above the ring presses the tube quickly out of the ring.

3,813,867

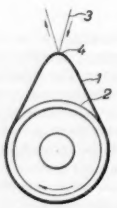
DEVICE FOR PRODUCING FALSE TWIST ON A THERMOPLASTIC FILAMENT

Osmo Juhani Ivanto, Otaniemi, Finland, assignor to Spinner Osakeyhtio, Karakallio, Finland

Filed Apr. 5, 1972, Ser. No. 241,271

Int. Cl. D02g 1/02

U.S. Cl. 57—77.4 8 Claims



A device for producing a false twist on a thermoplastic filament which, heated to a plastic condition, is on its path of travel made to touch an endless belt moving transversally with reference to it, and which belt has high friction against the filament and has been conducted over a pulley imparting a motion to it. For stabilizing the point of contact between the filament and belt the belt forms at this point a sharp bend, which prevents the hunting of the filament.

3,813,868

FRICTION FALSE-TWISTING DEVICE

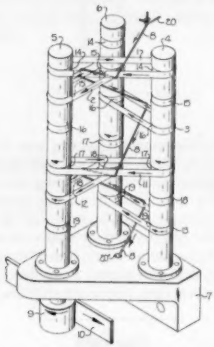
Hellmut Lorenz, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Dec. 4, 1972, Ser. No. 311,886

Claims priority, application Germany, Mar. 22, 1972, 2213881

Int. Cl. D01h 7/92; D02g 1/04

U.S. Cl. 57—77.4 13 Claims



One or more groups of three or more endless friction surfaces are supported for rotation and engage and impart a false-twist to a thread engaged thereby as it moves in a path of travel substantially perpendicular to the path of movement of the rotating friction surfaces. The friction surfaces of each group are equally spaced apart and are sequentially engaged by the thread along contact points which lie on a screw-thread line, the pitch and direction of which is determined by the direction of rotation and the positioning of the friction surfaces. The textured yarn produced by the present false-twist device may have torque in either the S or Z direction, depending upon the direction of rotation and arrangement of the friction surfaces. The friction surfaces are disclosed in the form of endless belts, rotating disks having crowned outer circumferential surfaces, and rotating rings having curved inner yarn engaging surfaces.

3,813,869

TWIST TRANSMISSION DEVICE FOR A RING SPINNING APPARATUS

Inosuke Misaki, Osaka, Japan, assignor to Nitto Shoji Limited, Osaka-shi, Osaka, Japan

Filed Aug. 27, 1973, Ser. No. 391,621

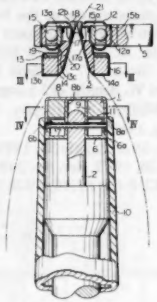
Claims priority, application Japan, Aug. 30, 1972, 47-88160

Int. Cl. D01h 7/18, 13/04

U.S. Cl. 57—106 5 Claims

Twist transmission device for carrying out migration of twists to the upstream yarn between the yarn guide and the nip point of the front rollers. The device comprises a cap secured to a spindle head or bobbin head, and a follower supported by a bracket. The cap and the follower are provided with a permanent magnet respectively, and each comprises a plurality of North and South pole magnetized portions alternately ar-

ranged. The magnet of the follower is provided with a yarn guide. And the yarn guide is forced to rotate in synchronous



condition with the rotation of the spindle by magnetic attraction between the permanent magnets of the cap and follower.

3,813,870

METHOD FOR AUTOMATICALLY DOFFING COPS IN A RING SPINNER

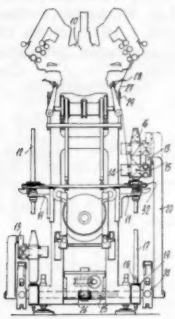
Giovanni Viglione, Genova-Sestri, Italy, assignor to Nuova San Giorgio S. p. A., Genova-Sestri, Italy

Filed Mar. 29, 1973, Ser. No. 345,833

Claims priority, application Italy, Apr. 19, 1972, 23372/70

Int. Cl. D01h *9/00, 9/02, 9/08*

U.S. Cl. 57—156 **5 Claims**



Method for automatic cop doffing in a ring spinner. According to the method, it is provided to grip the reels or cops by pliers carried by a spinner doffing device, adjacent the bottom end thereof to clamp the last coils of wound up yarn; to lift the reels or cops by a distance sufficient to tear the yarn and place a reel again on its associated spindle; then to grip the reels or cops at a higher location than the former, lifting such reels or cops to be unthreaded from the spindles and to complete the doffing operations for replacement with spools.

3,813,871

CLOCK UTILIZING A MAGNETIC ESCAPEMENT MECHANISM

Masakazu Hirose, Kanagawa, Japan, assignor to Jeco Kabushiki Kaisha, Kanagawa-ken, Japan

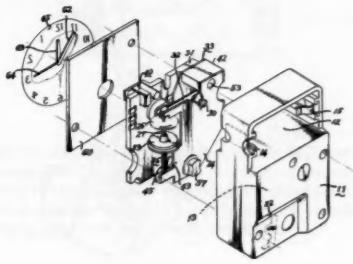
Filed Mar. 13, 1973, Ser. No. 340,646

Claims priority, application Japan, Oct. 27, 1972, 47-123414

Int. Cl. G04b *15/00*

U.S. Cl. 58—23 V **12 Claims**

A clock of the magnetic escapement type having a cyclically impulsed tuning fork mounted between frame plates which are formed of metal and synthetic resin, respectively. The tuning fork is secured to the edge of a base plate having a body portion which lies between the legs of the tuning fork and having a mounting portion. The base plate has a deep notch adjacent the region of securing of the tuning fork and the mounting portion engages a block of damping material secured to the frame. One leg of the tuning fork cooperates with a magnetic escapement wheel mounted upon an escapement shaft which



is vertically oriented. The escapement shaft has a worm driving a worm wheel in such a way that the reaction force of the worm wheel acts in a direction opposite to the action of gravity. The worm is of special anti-friction construction consisting of a coil spring with the corresponding portion of the shaft being annularly relieved. The escapement shaft has a flywheel with a manual wiper for starting purposes with the flywheel being loose upon the shaft.

3,813,872

BALANCE WHEEL ASSEMBLY FOR AN ELECTRIC TIMEPIECE

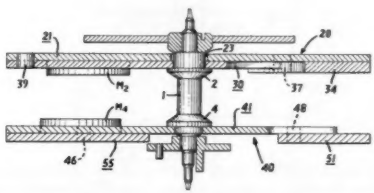
Yasuichi Nakagawa, Tokyo, and Tadashi Sakuma, Funabashi, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Nov. 27, 1972, Ser. No. 309,655

Claims priority, application Japan, Nov. 26, 1971, 46-110931

Int. Cl. G04c *3/04*; **G04b** *17/00*

U.S. Cl. 58—28 A **8 Claims**



A balance wheel assembly for an electric timepiece comprises a balance staff, upper and lower balance wheels connected in opposed spaced-apart relationship relative to each other to the balance staff, and permanent magnets affixed to each balance wheel. Each balance wheel has a nonmagnetic portion in contact with the balance staff and a magnetic portion spaced apart from the balance staff. The permanent magnets are affixed to the magnetic portions of the balance wheels and define therewith magnetic flux paths spaced from the balance staff thereby minimizing magnetic flux leakage to the balance staff and adjoining components.

3,813,873

SWITCHING DEVICE FOR ELECTRONIC WATCH

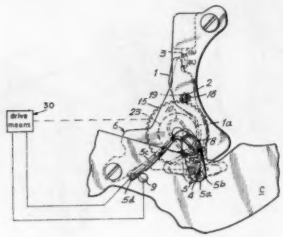
Yasukazu Nakagawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Mar. 20, 1973, Ser. No. 343,083

Claims priority, application Japan, Mar. 21, 1972, 47-27443

Int. Cl. G04b 27/00

U.S. Cl. 58—85.5 9 Claims



An improved switching device for an electronic watch is used for starting and stopping said watch. The device includes means for avoiding stress on the drive train and motor while setting the hands.

3,813,874

GAS TURBINE FOR SERIES OR PARALLEL OPERATION, SUBDIVIDED INTO AT LEAST TWO SECTIONS WITH PARALLEL AXES

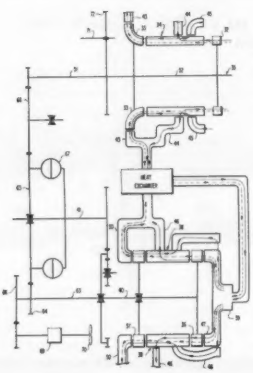
Werner Bruder, Neckarrems, and Hubert Grieb, Stuttgart, both of Germany, assignors to Motoren-Und Tubinen-Union Munchen GmbH, Munchen, Germany

Filed June 3, 1971, Ser. No. 149,544

Claims priority, application Germany, June 30, 1973, 2027223

Int. Cl. F02c 1/06, 7/02

U.S. Cl. 60—39.15 62 Claims



A gas turbine, particularly for vehicles, with a low-pressure compressor, a high-pressure compressor, a heat-exchanger, a combustion chamber, a compressor turbine, an output turbine with adjoining speed-reduction gear and with a shifting mechanism for series and parallel operation consisting preferably of shifting elements, in which the individual aggregates are subdivided into at least two sections with preferably parallelly disposed axes.

3,813,875

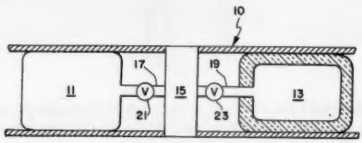
ROCKET HAVING BARIUM RELEASE SYSTEM TO CREATE ION CLOUDS IN THE UPPER ATMOSPHERE

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Beverley W. Lewis, 33 Fox Grove Drive, Hampton, Va. 23364; Charles S. Stokes, 27 Madison Rd., Willow Grove, Pa. 19090; Edward W. Smith, 402 Longwood Drive, Exton, Pa. 19341, and William J. Murphy, 213 Pheasant Rd., King of Prussia, Pa. 19406

Division of Ser. No. 59,892, July 31, 1970. This application Apr. 28, 1972, Ser. No. 248,761

Int. Cl. F42b 13/46; F02k 9/00

U.S. Cl. 60—39.46 4 Claims



A chemical system for releasing a good yield of free barium (Ba°) atoms and barium ions (BA^+) to create ion clouds in the upper atmosphere and interplanetary space for the study of the geophysical properties of the medium.

3,813,876

STEAM POWER PLANT FOR A MARINE VESSEL

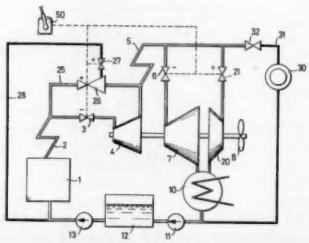
Richard Joseph Dolezal, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Feb. 1, 1973, Ser. No. 328,671

Claims priority, application Switzerland, Feb. 3, 1972, 1591/72

Int. Cl. F01k 7/00

U.S. Cl. 60—102 10 Claims



The power plant includes one turbine having high and low pressure stages for driving the propeller screw during ahead travel and a second turbine for driving the propeller screw during astern travel. In addition, a reheater is interposed between the two stages of the first turbine. Bypass means are included to direct the generated steam around the first turbine to the second turbine for astern travel while also passing the steam through the reheater. During bypass, the steam can be throttled and cooled before passing into the reheater.

3,813,877

INTERNAL COMBUSTION ENGINE CONTROLS FOR REDUCED EXHAUST CONTAMINANTS

Duane A. Hunt, East Lansing, Mich., assignor to Donnell R. Matthews, Jr., East Lansing, Mich.

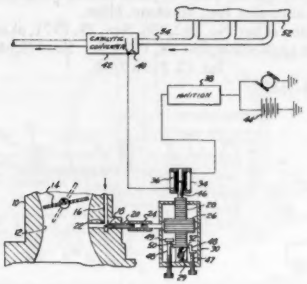
Filed Aug. 17, 1972, Ser. No. 281,465

Int. Cl. F02b 75/10

U.S. Cl. 60—284 18 Claims

Engine operating system for association with catalytic exhaust converters operable to provide proper timing and/or

fuel mixture for engine ignition, a brief warm-up period as controlled by temperature at or adjacent the converter, and



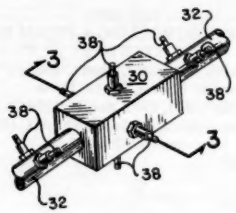
thereafter a normal timing range and fuel mixture during further operation.

3,813,878

METHOD AND APPARATUS FOR REDUCING EMISSION OF POLLUTANTS IN EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE

Joseph W. McKee, 570 North Hwy., Broomfield, Colo. 80020

Filed Mar. 22, 1972, Ser. No. 237,027
Int. Cl. F01n *3/14*
U.S. Cl. 60—303 **3 Claims**



A system for reducing the emission of pollutants in the exhaust gas from an internal combustion engine characterized by an engine driven air pump which delivers air under pressure to an exhaust manifold, and an afterburner disposed downstream from a muffler which is provided with spark plugs energized by a vibrating type high voltage coil which provides continuous sparking across the spark plug gaps. The afterburner is constructed to prevent back pressure in the exhaust system and the spark plugs are disposed at points of high turbulence in the exhaust gas to promote substantially continuous ignition of combustibles with the added air.

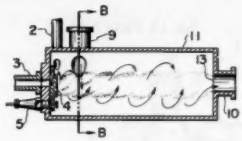
3,813,879

AFTER-BURNER FOR AN INTERNAL COMBUSTION ENGINE

Tokuta Inoue; Mitsumasa Yamada; Kiyoshi Nakanishi, all of Susono; Yasushi Tanasawa, Nagoya, and Shunzo Yamaguchi, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-cho, Toyota-shi, Japan

Filed July 11, 1972, Ser. No. 270,837
Claims priority, application Japan, Sept. 10, 1971, 46-070104
Int. Cl. F01n *3/14*
U.S. Cl. 60—303 **7 Claims**

An after-burner for an internal combustion engine having a cylindrical recombustion chamber, an air inlet pipe connected to the cylindrical chamber for tangentially introducing air, a fuel inlet pipe connected to the cylindrical chamber at a port disposed in a first end of the cylindrical chamber, an ignition plug disposed in the first end for igniting the mixture of fuel and air, an exhaust gas inlet pipe connected to the cylindrical



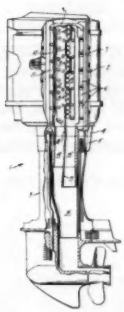
chamber for tangentially introducing exhaust gas from an internal combustion engine, and an outlet pipe connected to the cylindrical chamber at a port disposed in the second end of the cylindrical chamber coaxially to the cylindrical chamber for discharging gases from the cylindrical chamber.

3,813,880

EXHAUST TUNING SYSTEM FOR TWO-STROKE ENGINES

Raymond R. Reid, and Richard A. Lanpheer, both of Oshkosh, Wis., assignors to Brunswick Corporation, Chicago, Ill.

Filed Aug. 7, 1972, Ser. No. 278,239
Int. Cl. F01r *7/08;* **B63h** *21/26*
U.S. Cl. 60—314 **8 Claims**

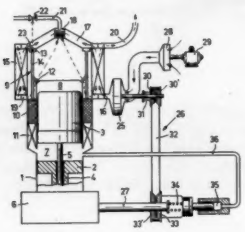


A two-stroke multiple cylinder engine includes a pair of exhaust chambers having a common control wall and each of which is connected between a corresponding plurality of selected cylinders and a common exhaust passageway. The connection between each of the chambers and the passageway is defined by a tuning section which is constructed of a sufficient length and configuration to generate a negative pressure pulse to aid scavenging and reflected positive pulses from the fired cylinder. In addition, the next fired cylinder of each group establishes super-charging of the engine. The common wall between the two tuned passageways is provided with a transfer port for transferring of a positive pressure signal from the one passageway into the opposite passageway which travels back toward the engine to provide a further positive super-charging pulse to the opposite exhaust chamber. The feedback pressure wave can be applied with particular advantage to four and two cylinder engines.

3,813,881
HOT-GAS ENGINE

Gregorius Theodorus Maria Neelen, Dordrecht, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,108
Claims priority, application Netherlands, Sept. 17, 1971, 7112770
Int. Cl. F03q 7/06
U.S. Cl. 60—521 3 Claims

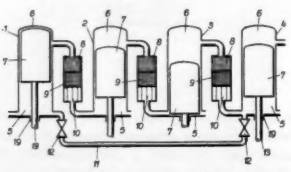


A hot-gas engine having a burner device which is provided with a fuel supply and a fan which is coupled to the engine shaft for supplying air of combustion, the supply of air of said fan being controllable in accordance with the average pressure in the working space of the engine, a small auxiliary fan having a small pressure increase and a large volume flow being arranged in series with the main fan and being driven with a constant number of revolutions.

3,813,882
HOT-GAS ENGINES

Karl Wolfgang Hubschmann, Langweid, Germany, assignor to Motoren-Werke Mannheim AG Vorm. Benz abt. Stationarer Motorenbau, Postfach, Mannheim, Germany

Filed Nov. 14, 1972, Ser. No. 306,558
Claims priority, application Germany, Nov. 16, 1971, 2156773
Int. Cl. F03g 7/06
U.S. Cl. 60—525 8 Claims

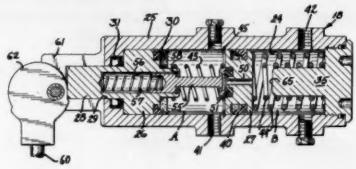


A double-acting hot gas engine includes four or a higher even number of cylinders which comprise pairs whereof the cylinders are phase-displaced through a 180° crank angle. An expansion chamber of each cylinder is connected, by way of a heater, a regenerator and a cooler arranged in series, to a compression chamber of another cylinder. At least for partial load, the compression chambers of each pair are interconnected via an overflow path for a time period extending throughout part of each of successive working cycles of each pair, the time period being increased if the load decreases.

3,813,883
HYDRAULIC ACTUATOR

Frederick W. Cords, Lake Crystal, Minn., assignor to Minnesota Automotive Inc., Mankato, Minn.

Continuation of Ser. No. 202,850, Nov. 29, 1971, abandoned.
This application June 18, 1973, Ser. No. 370,688
Int. Cl. F15b 7/08
U.S. Cl. 60—582 7 Claims

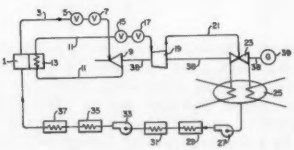


A hydraulic actuator has a hydraulic cylinder with first and second pistons located therein. An inlet port formed in the hydraulic cylinder is connected to a source of hydraulic fluid and an outlet port connected to a hydraulic device to be actuated is formed in the hydraulic cylinder between the first and second pistons. A lever is mounted on the hydraulic cylinder to displace the first piston to increase pressure at the outlet port, to actuate the hydraulic device to be actuated and to displace the second piston when the pressure at the outlet port reaches a predetermined pressure so as to maintain actuation of the hydraulic device to be actuated.

3,813,884
SYSTEM FOR CONTROLLING A STEAM TURBINE AT START-UP

Motosuke Ishikawa, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1972, Ser. No. 294,763
Claims priority, application Japan, Oct. 21, 1971, 46-82844
Int. Cl. F01k 7/24
U.S. Cl. 60—657 8 Claims



A reheat turbine having a control valve in a reheat conduit to provide a system for switching from controlling the turbine utilizing a main stop valve control to controlling the turbine utilizing a sequentially operable governing valve so that there is a minimal change in the steam temperature in the first stage of the turbine as a result of switching from one mode of control to the other.

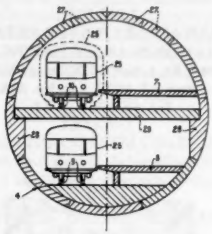
3,813,885
METHOD FOR CONSTRUCTING AN UNDERGROUND RAILWAY

John R. Tabor, 3400 Spruce St., Racine, Wis. 53403

Filed May 19, 1971, Ser. No. 144,888
Claims priority, application Netherlands, May 28, 1970, 7007758
Int. Cl. E01g 3/04
U.S. Cl. 61—44 5 Claims

Method and apparatus for constructing an underground railway which includes platform station tunnels and intercon-

necting carrier tunnels, both the platform station tunnels and carrier tunnels being constructed as a gradually formed subsurface gallery, without excavating through the overburden.



All the tunnels are formed with the aid of an underground tunneling machine housed in a shield. All tunnels have substantially the same profile.

3,813,886

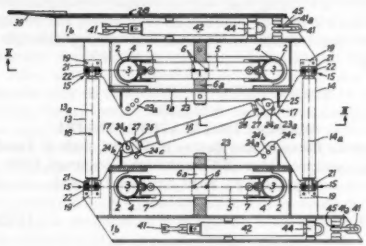
TRAVELLING SHORING APPARATUS

Georges Alacchi, Villa Saint-Joseph rue Jules Ferry, Frais Marais Douai Nord, France

Filed Jan. 2, 1973, Ser. No. 320,619

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 D **9 Claims**



A travelling shoring apparatus for inclined strata comprises two sets of shoes, one of which is situated on the working face and the other is situated on the side of the filling material, each shoe in a set being connected to a corresponding shoe of the other set by means of two double-acting shift rams 13, 14 fixed to the coupled shoes by means of universal joints 15 which determine, before and after shifting, a parallelogram 18, and by a connecting ram 16, the axis of which substantially coincides with the small diagonal of parallelogram 18. This shoring is used in particular for exploitation of inclined strata.

3,813,887

METHOD AND APPARATUS FOR REMOVING LIQUID CONTAMINANTS FROM A SUBMERGED TANK

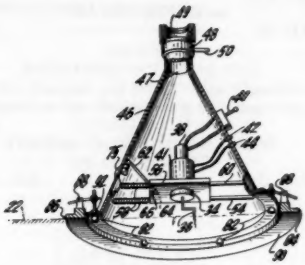
Jean J. Kruger, Northport, N.Y., and Vincent E. Rossitto, 58 Higbie Ln., West Islip, N.Y. 11795, assignors to said Rossitto, by said Kruger

Filed Mar. 3, 1972, Ser. No. 231,631

Int. Cl. B63c *1/40*

U.S. Cl. 61—69 R **12 Claims**

A method and apparatus for forming holes in the wall of a submerged tank and removing liquid material therefrom. First and second holes are first formed in the wall of the tank wherein the first hole is positioned higher than the second hole. The holes are formed in such a manner as to prevent the liquid material from escaping the tank and contaminating a liquid body surrounding the tank. The liquid material is pumped out from one of the holes while the liquid surrounding the submerged tank enters the other of the holes. The holes



are formed by using an air drill which is mounted on a spring-loaded frame within a cone-shaped housing, wherein the base of the cone-shaped housing is fastened to a side of the tank. The drill is positioned along the center line of the cone while the hole is being formed and the spring-loaded frame carries the drill away from the center line of the cone after the hole is formed, if access to the formed hole is desired.

3,813,888

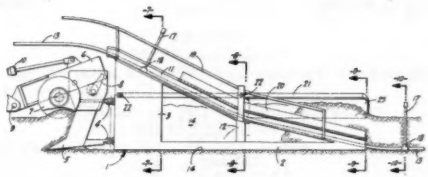
APPARATUS FOR LAYING SUB-SURFACE IRRIGATION PIPE

Billy Joe Purviance, 3737 N. Duncan Rd., Linden, Calif. 95236

Filed Jan. 8, 1973, Ser. No. 321,765

Int. Cl. E02f *5/10*; F16l *1/00*

U.S. Cl. 61—72.6 **7 Claims**



The apparatus is of the general type employed to lay, subsurface and to a controlled depth, a continuous run of relatively small-gauge plastic irrigation pipe initially disposed atop the ground. The apparatus functions, as it moves along said run of pipe, to first open a narrow trench in the soil, and to then progressively guide and depress the pipe into the trench by means of a pipe guide and depressing unit which extends into the trench from above the ground; the pipe—as laid in the trench—being held in place by filling said trench with soil. The pipe guide and depressing unit, and to which the present invention essentially relates, is formed in a fashion to permit—while progressively guiding and depressing the pipe into the trench—unobstructed passage through said unit of risers connected at intervals to the pipe.

3,813,889
SEPARATION OF GAS MIXTURES

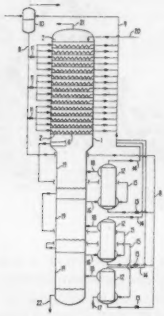
Rodney John Allam, Hampton Hill; Bernard Ramsay Bligh, Guildford, both of England, and Lee S. Gaumer, Allentown, Pa., assignors to Air Products and Chemicals, Inc., New Malden, Surrey, England, by said Allam and Bligh

Filed Mar. 22, 1971, Ser. No. 126,727

Claims priority, application Great Britain, Mar. 26, 1970, 14896/70

Int. Cl. F25j *1/00, 1/02*

U.S. Cl. 62—22 **7 Claims**



A process and plant for obtaining substantially pure hydrogen or helium in which a mixture of hydrogen and/or helium and nitrogen and/or carbon monoxide, cooled to near its dew point at a pressure in the range 5 to 55 atmospheres, is fed into the bottom of a refrigerated wash-column while a liquid methane stream is fed in at the top. Hydrogen and/or helium is taken from the top of the column; a liquid stream containing methane and nitrogen and/or carbon monoxide is taken from the bottom.

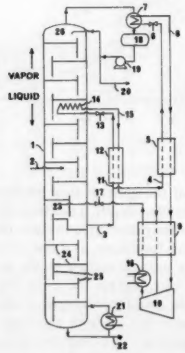
3,813,890
PROCESS OF CONTINUOUS DISTILLATION

Bernard Ramsay Bligh, 4, St. James's Ave., Hampton Hill, Middlesex, England

Filed Apr. 14, 1971, Ser. No. 133,913

Int. Cl. F25j *3/02, 3/08, 5/00*

U.S. Cl. 62—40 **7 Claims**



Method and apparatus for continuous distillation in which products are removed from the ends of a distillation column and are also removed from an intermediate zone of the column, subjected to a refrigeration cycle and returned at least in part to the column, and reflux and reboiling are provided at more than one zone of the column.

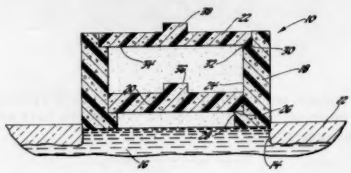
3,813,891
METHOD AND APPARATUS FOR RETARDING ICE FORMATION IN AN ICE FISHING HOLE

Homer C. Wootten, Rt. 1, Box 25, Hillman, Mich. 49746

Filed Aug. 13, 1973, Ser. No. 388,042

Int. Cl. F25d *23/12*

U.S. Cl. 62—56 **4 Claims**



A method and apparatus for preventing and retarding the freezing of ice fishing holes when not in use. The apparatus utilizes a buoyant housing having a passage therethrough in communication between the water in the ice fishing hole and the atmosphere. Covers in the housing prevent the passage of air and heat energy from the water through the passage to the atmosphere. The method includes the steps of surrounding an area of an ice fishing hole with an insulative material through which such a passage is provided and sealing the passage to prevent the transfer of air and heat energy through said passage.

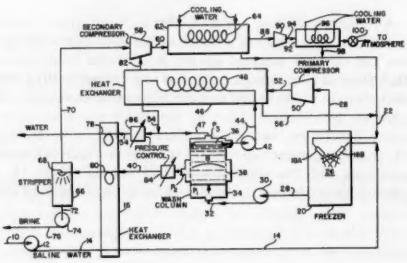
3,813,892
WATER PURIFICATION SYSTEM

Wallace E. Johnson, and James H. Fraser, both of Topsfield, Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Aug. 23, 1971, Ser. No. 173,991

Int. Cl. B01d *9/04*

U.S. Cl. 62—58 **12 Claims**



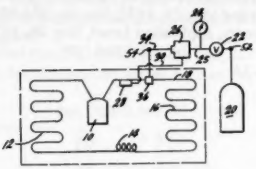
A water purification system useful, for example, in the desalination of saline water, which system uses means for crystallizing the water in such saline solution through the use of an appropriate refrigerant to form a slurry of ice crystals and brine which is fed to a wash column for separating the brine from the ice crystals. The ice crystals form a porous ice bed for movement through the column, such bed being washed by a wash liquid flowing in direction counter to the ice bed movement. Ice is removed at one end of the column and brine and wash water is removed through an intermediate permeable port of the column, the ice preferably being melted by indirect heat exchange with vaporized refrigerant. The pressure relationships at the input end of the ice bed, at the in-

termediate permeable port, and at the output end of the ice bed are controlled independently of the pressures at the crystallizer and at the melter units of the system, such pressures being capable of adjustment in accordance with the size of the ice crystals formed in the crystallizer (and, hence, the permeability of the porous ice bed formed in the wash column) to provide for maximum ice output from the column and minimization of wash liquid loss therein.

3,813,893
REFRIGERATION SYSTEM CHARGING KIT

John F. Gemender, and Eric H. Schwenker, both of Jackson, Mich., assignors to Addison Products Company, Addison, Mich.

Filed Oct. 30, 1972, Ser. No. 301,893
Int. Cl. F25b *45/00*
U.S. Cl. 62—129 **6 Claims**

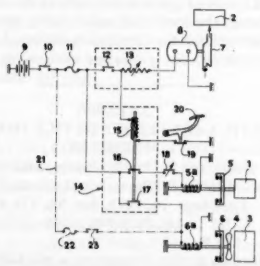


Apparatus, in the form of a kit, for charging refrigeration systems utilizing a refrigeration system suction line wherein a thermostatically operated valve sensing suction line temperature controls the introduction of refrigerant into the refrigeration system. A restrictor is interposed between the thermostatic valve and the refrigeration system suction line controlling the rate of flow of the refrigerant supplied to a rate permitting the refrigerant supplied to the thermostatic valve to be in a liquefied state, and at a rate which prevents overcharging of the system. A manually operated shutoff valve, and pressure gauge, interposed between the refrigerant supply and the thermostatic valve permits determination of the condition of the system being charged. Insulative means mount the thermostatic valve temperature sensing bulb to the suction line to permit accurate suction line temperature sensing.

3,813,894
COOLING APPARATUS FOR AN AUTOMOBILE VEHICLE

Michel Bonnaud, Montbeliard, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Billancourt, France

Filed Mar. 6, 1973, Ser. No. 338,513
Claims Priority, application France, Mar. 17, 1972, 72.09474
Int. Cl. F25b *27/00*
U.S. Cl. 62—181 **1 Claim**

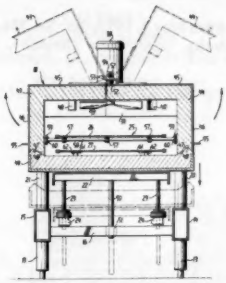


Cooling apparatus for an automobile vehicle comprising a compressor, an evaporator, a condenser and a fan associated with the condenser. The compressor and the fan are adapted to be driven by the vehicle engine through respective electromagnetic clutches controlled through electric control circuits. This apparatus is improved in that cut out means are inserted in the electric control circuit of the compressor and/or fan. The cut out means are controlled by a control member controlling the acceleration of the vehicle so as to release automatically the clutch of the compressor and/or fan when the control member reaches a given position.

3,813,895
FOOD FREEZING APPARATUS

David J. Klee, Emmaus, and John T. Sills, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sept. 28, 1972, Ser. No. 292,869
Int. Cl. F25d *23/02*
U.S. Cl. 62—266 **19 Claims**

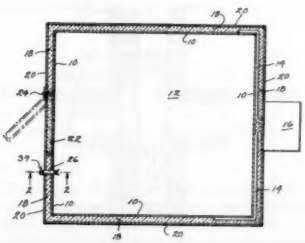


Apparatus for continuous cooling of articles comprising an elongated tunnel having an endless conveyor for moving articles therethrough in an atmosphere of a cryogenic fluid. The tunnel is defined by a plurality of sections alternate ones of which have hinged top covers and downardly movable bottoms which may be opened to gain access to the interior of the tunnel to facilitate cleaning thereof. The conveyor and all of the fluid handling apparatus are carried by stationary, nonopenable sections of the tunnel which are disposed between the alternate openable sections. Also disclosed is a pivotable arcuate baffle for directing cryogenic fluid toward the article inlet end of the tunnel.

3,813,896
FREEZER AIR VENT

Arthur C. Lebahn, River Falls, Wis., assignor to The Vollrath Co., Sheboygan, Wis.

Filed Jan. 26, 1973, Ser. No. 326,705
Int. Cl. F25d *17/04*
U.S. Cl. 62—409 **8 Claims**



An air vent extends through one wall of a freezing chamber and communicates with the outside atmosphere through a

vacuum relief valve and a pressure relief valve. When a partial vacuum condition develops within the freezing chamber due to the removal of airborne moisture by the freezing process, a vacuum-responsive element in the vacuum relief valve opens and admits atmospheric air into the freezing chamber to relieve the partial vacuum. When an increase of pressure develops within the freezing chamber due to the closing of the freezer door, a pressure-responsive element in the pressure relief valve opens to relieve the increase of pressure. A heater coil is wound around the interior of the air vent to prevent it from becoming clogged with ice.

3,813,897

RESILIENT SHAFT COUPLING FOR READY ASSEMBLY AND DISASSEMBLY

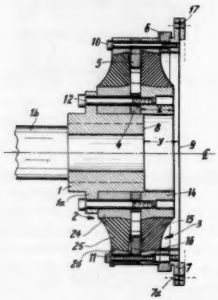
Heinz M. Hiersig, Dusseldorf-Oberkassel; Klaus Hansgen; Gerhard Ridder, both of Witten, and Wolfgang Sudhoff, Dortmund-Mengede, all of Germany, assignors to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany

Filed May 3, 1973, Ser. No. 356,994

Claims priority, application Germany, May 17, 1972, 2225024

Int. Cl. F16d *3/78*

U.S. Cl. 64—13 **6 Claims**



A resilient coupling as between a hub and a flange is constructed for step-wise removal laterally (radially) from and through particular clearance space between the rotatable parts as interconnectable by the coupling.

3,813,898

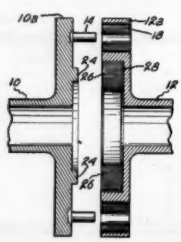
HIGH TORQUE CRYOGENIC COUPLING

Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,246

Int. Cl. F16d *3/52*

U.S. Cl. 64—15 R **2 Claims**



A thermally insulated coupling for either rotatably or axially connecting a driving shaft and a driven shaft. In either application, the coupling is designed to present a high impedance to thermal heat flow between the two shafts. The present invention is applied to a basic rotatable coupling wherein a plurality of axially extending pins protruding from a flange on one shaft are mated with apertures in a flange on a second shaft. The present invention concentrically positions a spirally wound coil of metallic material between each drive pin and the wall of the corresponding aperture in which each drive pin is engaged. For application to the axial transmission of force between two axially aligned shafts, a plurality of bosses axially protruding from a flange of one shaft about the exposed edges of a corresponding plurality of metallic spiral coils which are disposed in cavities in an end flange of the second shaft.

3,813,899

SLIDING COUPLING FOR PROPELLER SHAFTS

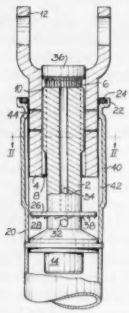
Salek Abrahamer, 42 Shomzion Hamalke, Tel Aviv, Israel

Filed May 23, 1972, Ser. No. 256,005

Claims priority, application Israel, May 28, 1971, 36945

Int. Cl. F16d *3/06*

U.S. Cl. 64—23 **5 Claims**



A sliding coupling for automobile propeller shafts comprises an inner shaft having external splines, an outer shaft having internal splines, and a telescoping sleeve joined to the inner shaft and bearing against the external surface of the outer shaft to maintain the two shafts in alignment, to support the coupling against sagging upon wear and to provide an enclosure for lubricating oil. In one embodiment, the inner shaft is formed with an axial passageway for lubricating oil supplied to the splines and to the inner surface of the telescoping sleeve, there also being a vaned-disc for circulating the oil. In another embodiment, an annular space is provided between the inner shaft and the telescoping sleeve at one end of the splines, and a second space is provided at the other end of the splines between the inner and outer shafts, these spaces serving as a reservoir for the lubricating oil which is supplied by centrifugal action to the splines and telescoping sleeve.

3,813,900

PNEUMATIC YARN FEEDER DEVICE FOR KNITTING MACHINES

Willard P. Cook, and J. Howard Baker, both of Drexel, N.C., assignors to Scott & Williams, Inc., Laconia, N.H.

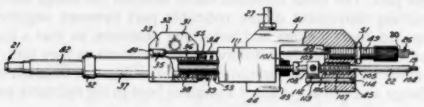
Filed Sept. 10, 1971, Ser. No. 179,484

Int. Cl. D04b *15/48*

U.S. Cl. 66—125 R **13 Claims**

A yarn feeding device comprising a plurality of concentric and axially aligned tubes forming a compact, slender structure adapted to be employed in a confined yarn feed station of a knitting machine. The feeder includes the features of pneu-

matic yarn feed control, reciprocation of the feeder along its axis towards and away from the needles to provide positive yarn feeding and to provide room for the subsequent introduc-



tion of other yarn feeders in the same area, and a space saving axially actuated yarn clamp for introducing and terminating yarn feed.

3,813,901

KNITTING OF SLEEVED GARMENTS

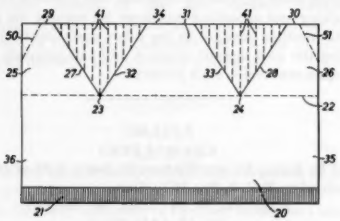
Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

Filed Nov. 21, 1972, Ser. No. 308,441

Claims priority, application Great Britain, Nov. 22, 1971, 54098/71

Int. Cl. D04b *7/00*

U.S. Cl. 66—189 **3 Claims**



A method of knitting a blank for a sleeved garment which blank includes a split body portion and two sleeves integrally formed with the body portion, wales of each sleeve being joined to wales of the body portion at a junction line of stitches. The method comprises knitting, in the direction towards, and up to, the junction lines, a single piece of fabric intended to form the split body portion, the knitting being carried out on needles of a first or first and second arrays of needles of a machine having two opposed arrays of needles in such a manner as to produce the fabric in opened out form, rearranging loops of the fabric to locate the loops in the junction lines of stitches in positions on both the arrays of needles in relation to each other and the remaining loops of the fabric which they are to occupy in the finished blank, and then knitting on from both the junction lines of stitches to form shoulder portions of the sleeves, and extending each shoulder portion by a piece of tubular fabric constituting a sleeve of the garment blank knitted on needles employed for knitting the respective shoulder portion.

3,813,902

INSTALLATION FOR PROGRAMMED DYEING OF THREADS, RIBBONS AND SIMILAR

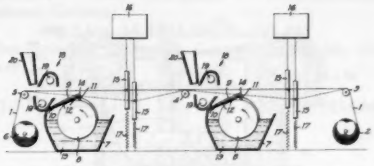
Alphonse Debonnet, Kortestraat, 13 A2, 8700, Izegem, Belgium

Filed June 19, 1972, Ser. No. 263,813

Int. Cl. B05c *1/04*

U.S. Cl. 68—19.1 **5 Claims**

The invention pertains to a method for programmed dyeing of threads, ribbons and similar, whereby the threads are moved along mutually close parallel tracks opposite to at least one dye supply and, depending on the program selected, a relative motion is caused between said moving threads and the



dye supply with the purpose of having these threads and the dye come temporarily into contact, or of removing them one from another.

3,813,903

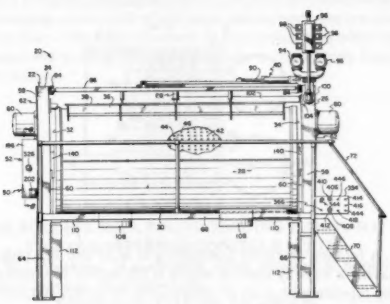
LAUNDRY MACHINE

Alex Toth, Lincolnwood, Ill., assignor to Ellis Corporation, Chicago, Ill.

Filed Feb. 1, 1973, Ser. No. 328,702

Int. Cl. D06f *21/04*

U.S. Cl. 68—210 **32 Claims**



A laundry machine includes end frames rotatably supporting an outer casing and an inner cylinder. A coupling assembly interlocks the casing with the frame during laundry operations while the cylinder rotates, and interlocks the casing and the cylinder for simultaneous rotation, with the casing and cylinder doors aligned, for bottom unloading and top loading operations. A positioning assembly locates the cylinder, or the interlocked cylinder and casing, in a precise angular position relative to the frame so that the coupling assembly may operate. Electrical and pneumatic controls carry out laundry, unloading and loading, positioning, and coupling operations in a safe and reliable sequence.

3,813,904

LOCKING GAS CAP

Alan G. Wallskog, Prospect Heights, Ill., assignor to E. Edelmann & Co., Skokie, Ill.

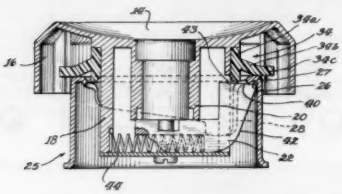
Filed Apr. 24, 1972, Ser. No. 246,773

Int. Cl. B65d *55/14*

U.S. Cl. 70—169 **3 Claims**

A universal gas cap adapted to lock to gas tank filler necks of different sizes. The cap includes a cup-shaped member having a transverse wall and perimetral flange or skirt depending therefrom which is adapted to engage the outer surface of a large diameter filler neck. A central cylinder which carries latching tongues that are biased toward the skirt or flange is carried by the transverse wall and is concentrically located

with respect to the skirt. The outer surface of the cylinder is adapted to engage the inner surface of a small diameter filler neck and the tongues are arranged to engage notches provided



in the flange portion of either neck to secure the cap to the neck. Annular gasket means mounted to the cylinder sealingly engage the filler neck top.

3,813,905

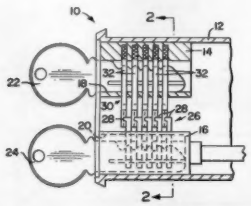
MASTER-SLAVE KEY

Kenneth D. Sauder, 1861 Brentwood Dr., Clearwater, Fla. 33516

Filed Nov. 10, 1972, Ser. No. 306,026

Int. Cl. E05b *25/00, 35/12*

U.S. Cl. 70—339 **4 Claims**



A locking assembly comprising at least two key plugs each having a keyway each of which is positioned in communicating relation with a set of either slave or master tumblers. The plurality of tumblers in each set movably engage the correspondingly positioned plurality of tumblers in the outer set such that the locking-unlocking combination may be varied by inserting keys having different bitings in the keyway associated with the master tumblers thereby automatically positioning the master tumblers such that unlocking the assembly can only be accomplished by positioning the slave tumblers in predetermined positions through the use of a second key having the same biting or a predetermined biting relative to the first key. Key removal prevention means may also be mounted on the assembly such that removal of either key is prevented unless the keys are in locked or unlocked position. Securing means may be also provided wherein the position of the slave and master tumblers are initially set by a first key whereupon the securing means is arranged in securing position so as to maintain the master tumbler in a predetermined, set position relative to the slave tumbler thereby allowing for variable determining of the locking-unlocking combination by only a single key.

3,813,906

AXIAL SPLIT-PIN TUMBLER-TYPE LOCK

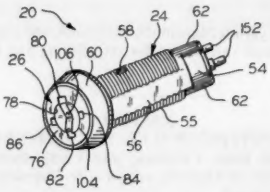
William J. Kerr, Glenview, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Apr. 25, 1973, Ser. No. 354,449

Int. Cl. E05b *27/08*

U.S. Cl. 70—363 **13 Claims**

An axial split-pin tumbler-type lock includes a lock cylinder and a barrel assembly within the cylinder and including rotatable and stationary parts carrying the tumbler elements. The lock includes an end closure flange having slot means and cooperating with a post on the rotatable part for limited access through the slot means to the elements carried by the rotatable part. The latter elements travel beneath the flange during turning movement of the rotatable part between angularly spaced apart locking and unlocking positions, so that a lock pick is prevented from following the elements as they turn. A tumbler element in the stationary part is located beneath the flange and will act to enter a tumbler bore in the rotatable part



for engaging the part in a difficultly hidden position, to prevent further turning movement and thereby thwart a picking attempt, in the event that an initial picking operation is successful. Angularly spaced apart slots in the flange and tumbler elements in the stationary part in alignment with respective slots provide for insertion and removal of a key in the locking and unlocking positions, for turning the rotatable part from either position to the other upon insertion and for securing the part against rotation and safeguarding the lock code upon removal in each position.

3,813,907

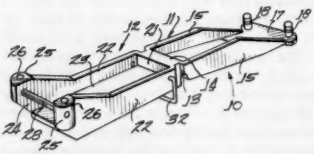
KEY HOLDERS

Robert H. Jones, Jr., and Richard B. Jones, both of c/o J. & J. Casting Inc. R.R. 1, Box 267, Minn.

Filed June 26, 1972, Ser. No. 266,069

Int. Cl. A47g *29/10*

U.S. Cl. 70—456 R **8 Claims**



A novel key holder formed of a suitable metal or plastic material having two complementary halves hinged together and provided with a friction catch to retain the holder halves closed. The holder has an open end opposite the hinge with a transverse rod upon which the keys are pivoted from a position within the holder to an operative position projecting from the holder. The holder may also include generally circular recesses undercut to hold coins for use in parking meters.

3,813,908

METHOD OF ADAPTIVE THREAD

C. Michael Miglore, Scotia, N.Y., assignor to General Electric Company, Salem, Va.

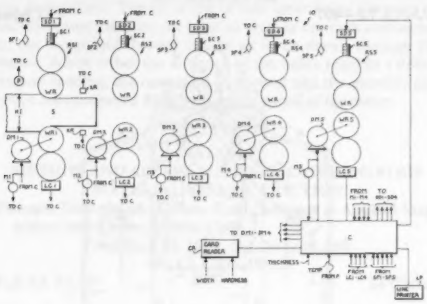
Filed Dec. 18, 1972, Ser. No. 315,815

Int. Cl. B21b *37/02*

U.S. Cl. 72—16 **17 Claims**

A method of finish mill adaptive thread is described wherein an observed error in per unit draft at an upstream stand is compensated in the remaining active downstream stands of

the mill by changing the per unit draft of the downstream stands by an amount proportional to the original per unit draft of each stand. Preferably, the percentage of draft change in the downstream stands is determined implicitly by solution of an error equation which defines the necessary relationship



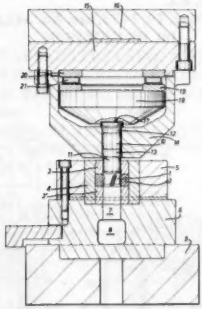
between the observed error and controllable variables within the mill. Because the relative drafting pattern between downstreams stands of the mill remains substantially unchanged, the delivery stand normally receives the smallest percentage of the total adjustment and the risk of exceeding restraining limits on any one stand is reduced.

3,813,909

METHODS OF EXTRUDING HELICAL GEAR BLANKS

Yves Roger, Billancourt, France, assignor to Regie National des Usines Renault, Automobiles Peugeot, Billancourt and Paris, France

Filed Nov. 18, 1971, Ser. No. 199,987
Int. Cl. B21b *19/00*
U.S. Cl. 72—95 **12 Claims**



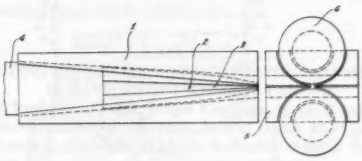
Method of manufacturing helical gear blanks by cold extrusion, characterized in that it comprises the steps of passing successive billets through a die formed with internal helical teeth in order to impress these internal helical teeth by extrusion in the billet for forming external helical teeth in the cylindrical surface of said billets, said billets being driven through said die by a punch adapted to rotate freely.

3,813,910

METHOD AND APPARATUS FOR MAKING TUBING FROM METAL TAPE

Kurt Muller, Hannover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Aug. 14, 1972, Ser. No. 280,483
Claims priority, application Germany, Aug. 16, 1971, 2140945
Int. Cl. B21f *11/00*
U.S. Cl. 72—130 **15 Claims**



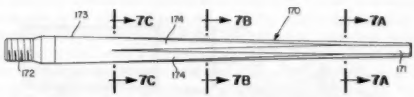
Thin metal tape or strip is longitudinally folded into tubular form by means of a conical die with conical mandrel. The tape or strip is slightly bent temporarily just prior to folding so that the resulting convex side of the tape or strip becomes the inner tube surface. The tube is formed to have radial tabs which are trimmed and welded. The resulting tube is consistently impervious to fluid.

3,813,911

TUBE ROLLING MILL FOR PRODUCING TUBING WITH VARIOUS INTERNAL CONFIGURATIONS

Fred W. Bibighaus, Wapakoneta, Ohio, assignor to Superior Tube Company, Norristown, Pa.

Filed Oct. 18, 1972, Ser. No. 298,616
Int. Cl. B21b *25/00*
U.S. Cl. 72—208 **8 Claims**



A tube rolling mill having two sets of three rolls each which are reciprocatingly driven along a length of a tube supported by a mandrel. Each roll is forced against the tube by individual cams that each have a surface of one or more tapers to provide controlled reduction in wall thickness of the tube. The mandrel is tapered to provide a reduction of inside tube diameter and is of a configuration to cause the inside wall of the tube to be shaped as for example in hexagonal form, simultaneously as the inside tube diameter and wall thickness are reduced. Various inside wall configurations may be produced such as clover leaf shapes, flat sided configurations, ovals, and a combination of circular and flat surfaces, each of the patterns running for the length of the finished tube.

3,813,912

THREE ROLL TYPE SHAPE STEEL ROLLING MILL

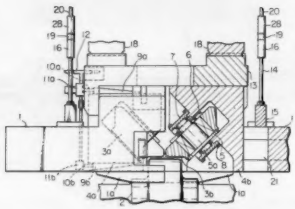
Akira Matsufuji; Kanichi Kishikawa, both of Kitakyushu; Yasuto Sasaki, Nohgata; Susumu Miyaji, Munakatamachi, and Fumihiro Tutui, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 24, 1972, Ser. No. 283,526

Claims priority, application Japan, Aug. 24, 1971, 46-64639; July 29, 1972, 47-76090

Int. Cl. B21b *13/10, 31/08*

U.S. Cl. 72—224 6 Claims



A three roll type shape steel rolling mill wherein two bearing boxes each containing an upper inclined non-driving roll are provided inside an inner stand and said inner stand is fitted detachably to the housing of said mill. It is possible to provide a lower horizontal driving roll also within said inner stand. Said inclined and horizontal rolls can be effectively adjusted with respect to period vertical and horizontal direction to provide a desired section of the shape steel.

3,813,913

Patent Not Issued For This Number

3,813,914

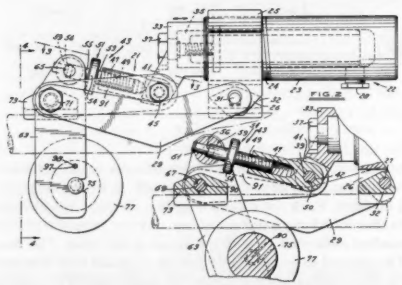
BENDING APPARATUS

Kenneth L. Hagemeyer, Rockford, Ill., assignor to Greenlee Bros. & Company, Rockford, Ill.

Filed Jan. 24, 1973, Ser. No. 326,219

Int. Cl. B21d *9/05*

U.S. Cl. 72—318 11 Claims



The invention relates to a hydraulically actuated bending apparatus, such as for wire, cable or pipe bending, and includes an adjustment means for adjusting the apparatus for accommodating various sizes or diameters of pipes or cables.

3,813,915

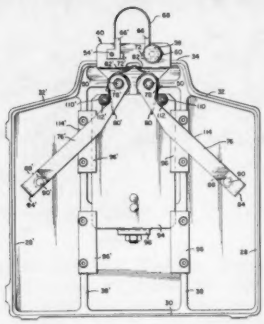
BENCH MOUNTING AND ACTUATING APPARATUS FOR HAND TOOL

Ronald Carl Brehm, Carlisle, and William Roderick Over, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 2, 1972, Ser. No. 303,165

Int. Cl. B21d *7/06*

U.S. Cl. 72—407 19 Claims



Bench mounting device for a conventional hand tool having two handles comprises a frame on which there is provided a tool head clamping means adapted to clamp the tool in a predetermined position. A pair of handle closing levers are mounted adjacent to the clamping means on a parallel spaced-apart axis and extend divergently with respect to each other. The ends of these levers are adapted to engage the ends of the handles of the tool so that when the levers are swung towards each other, they will move the handles from their open to their closed positions. The levers are swung by a slide actuator which is movable along a path extending away from, and towards, the clamping means. Rollers on the slide engage the levers to swing them towards each other when the slide moves away from the clamping means.

3,813,916

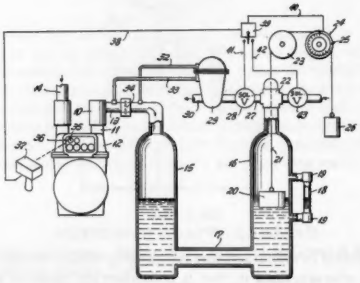
METER PROVING SYSTEM

Theodore A. St. Clair, Fairfield, Conn., assignor to Textron Inc., Providence, R.I.

Filed Mar. 19, 1973, Ser. No. 342,832

Int. Cl. G01f *25/00*

U.S. Cl. 73—3 11 Claims



There is disclosed a method and apparatus for proving fluid meters, such as gas meters, having index means wherein a pair of cylindrical tanks each of which is half filled with proving oil

has a connecting conduit between them near their bottom ends to achieve an initial common oil level, a float in one of said tanks being connected by a cable which passes over and operates an optical encoder indicates the rise and fall of the oil level in the tanks in terms of volume displaced. The cable passing over the encoder has a weight to counterbalance that of the float. One of the tanks is connected to the outlet opening of the meter to be tested while the inlet thereof is open to the atmosphere. The air in one of said tanks being removed by suction causes the test oil level to drop in the tank connected to the meter and thereby causes air to be drawn through the meter. When either the encoder or the index reaches a determinate reading, the operation is stopped and the encoder and index are compared to determine the proof of the meter.

3,813,917

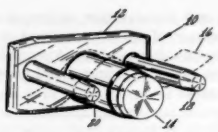
METHOD AND APPARATUS FOR MEASURING STRIP MATERIAL KINETIC FRICTION

Pleasant Taswell Cole, Goleta, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed May 18, 1971, Ser. No. 144,588

Int. Cl. G01n *19/02*

U.S. Cl. 73—9 **24 Claims**



Apparatus for measuring kinetic friction between a selected surface of a strip material and metal surface having a rotatable metal outer member and an inner surface of magnetic material, adapted to be rotated in an angle determined by the amount of kinetic friction, across an E-shaped transformer core to vary the magnetic flux path and magnetic coupling between the primary and secondary windings thereof which windings produce an analog voltage output signal which varies in amplitude as the magnetic material is rotated in proportion to the kinetic friction, capable of being used as an input signal to visual displays, chart recorders or control circuits is shown. A method for measuring such kinetic friction with a linear transformer is shown.

3,813,918

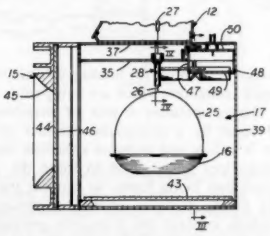
METHODS AND APPARATUS USING MICROWAVES FOR MATERIAL CHARACTERISTICS MEASUREMENTS

Lowell A. Moe, St. Paul, Minn., assignor to Ramex Company, Saint Paul, Minn.

Filed Dec. 23, 1971, Ser. No. 211,269

Int. Cl. G01n *5/04*

U.S. Cl. 73—15 B **7 Claims**



Methods and apparatus for measurement of the characteristics of materials wherein a sample of material is placed in an enclosed chamber supplied with microwave energy to volatilize an ingredient, such as moisture, in the sample. The content of the volatized ingredient is determined by measurement of the weight change, preferably with the weight being measured while the sample is within the chamber, immediately after application of the microwave energy. Dielectric absorption properties of the material are determined by microwave field measurements, preferably performed after moisture removal and before volatization of other ingredients. Important features relate to the coupling of a tray within the chamber to a weighing mechanism outside the chamber, to the use of a microwave stirrer and stopping of the stirrer at a certain position to permit accurate measurements, and to monitoring of the microwave field to control cut-off of the microwave energy and for other purposes.

3,813,919

TESTING APPARATUS FOR MEASURING THERMAL BEHAVIORS OF FILAMENT YARN

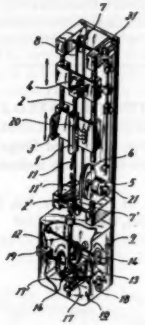
Motoji Taniguchi, Osaka; Shigeo Kitamura, Kobe; Kazutomo Ishizawa, and Murao Miyazaki, both of Osaka, all of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,106

Claims priority, application Japan, Dec. 28, 1970, 45-127851

Int. Cl. G01n *3/18*

U.S. Cl. 73—15.6 **20 Claims**



A testing apparatus for measuring quickly the thermal behaviors of thermoplastic synthetic filament yarns comprising a pair of upper and lower rods for holding a specimen of the filament yarn and a tube heater for heating the specimen at predetermined temperatures which tube heater is arranged coaxially with the said rods so as to be relatively movable to position the specimen and the rods therein, the said heater being provided with a means (e.g., spiral resistor) for keeping the temperature constant and uniform, a forced cooling means (e.g., air-cooling blower) and a controlling means for controlling the rate of increase of the temperature (e.g., temperature controller) thereby enabling quick response of the heater. The testing apparatus further comprises a twister and a preextension regulator.

3,813,920

MATCHED ACOUSTIC GENERATOR

Albert I. Talkin, Bethesda; Kenji Toda, Rockville, and Gary L. Roffman, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

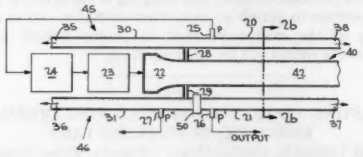
Filed Apr. 28, 1972, Ser. No. 248,480

Int. Cl. G10k *10/00*

U.S. Cl. 73—37 **11 Claims**

An apparatus is provided for frequency sweep testing of the insertion power gain of flueric proportional amplifiers and

passive components. This generator enables a rapid measurement of insertion power gain by pressure measurement only. In this apparatus two transmission lines of acoustic tubing, opened or closed at the far ends are fed acoustic power by an acoustic source sufficiently isolated from said tubing such that power input into each respective tube is independent of the line terminations. The transmission lines are of sufficient length such that the pressure at the input orifice is independent of the termination over the frequency range of interest. One of a matched pair of pressure transducers is located in the



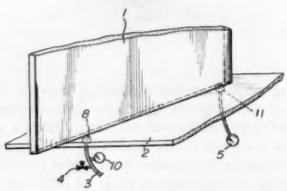
periphery of each transmission tube. An electronic feed back loop maintains pressure in one tube constant regardless of the frequency of the acoustic source. The device to be tested is interposed between the input orifice of the tube without the feed back loop and the pressure transducer connected to that tube. The feed back loop tube maintains the pressure at the undisturbed tube constant. The square of the ratio of the pressure reading of the pressure transducer in the tube containing the test device to the reading of the undisturbed tube is the insertion power gain of the device under test.

3,813,921

METHOD OF TESTING THE WELD ZONES OF ROLL CONSTRUCTION USING PRESSURIZED AIR

Naosuke Ozawa; Tachio Sudo, and Shigeki Watanabe, all of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1972, Ser. No. 279,939
Int. Cl. G01m *3/08*
U.S. Cl. 73—40 **1 Claim**



Compressed air is blown through a hole formed at one end of a transverse bulkhead into the clearance formed between a longitudinal bulkhead and a transverse bulkhead to test the water tightness of the weld zones formed thereat. Every block which is built as the hull construction based on known block system progresses, is tested and its water tightness confirmed thereby.

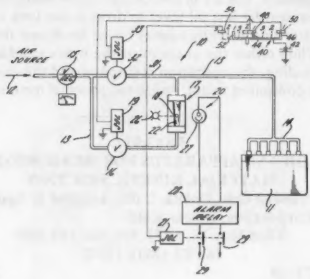
3,813,922

AIR LEAK DETECTOR

Thomas L. Oswald, St. Paul, and Alby H. Wolf, Minneapolis, both of Minn., assignors to Gould, Inc., Mendota Heights, Minn.

Filed Mar. 15, 1972, Ser. No. 234,826
Int. Cl. G01m *3/32*
U.S. Cl. 73—49.2 **3 Claims**

A leak detector in which a regulated pressure air source is coupled to a container under test through both an open-close valve and a flow meter having an element moved by slight air flow. A detector, of the photoelectric type, is positioned to respond to movement of the flow meter element back to zero. The valve is opened until the container is charged to test pressure with any further flow being the result of a leak, then the



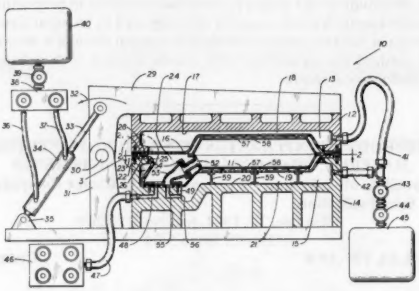
valve is closed and the detector activated so that it will respond to movement of the element back to zero if it had been displaced by flow due to a leak. A second charging valve bypasses the flow meter to permit rapid container charging and a short test cycle.

3,813,923

ADAPTIVE FIXTURE FOR LEAK TESTING OF CONTAINERS

Kenneth L. Pendleton, Indianapolis, Ind., assignor to Universal Sales Engineering, Inc., Indianapolis, Ind.

Filed May 23, 1972, Ser. No. 256,171
Int. Cl. G01m *3/32*
U.S. Cl. 73—49.2 **10 Claims**

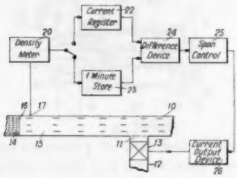


A fixture which is adaptive for holding a variety of different sized and shaped containers which are being subjected to leak testing. The fixture includes a pair of members movable together and apart by a pneumatic cylinder arrangement. Each member is hollow and includes a flexible diaphragm. A source of pressurized gas is used to force the diaphragms around the container being tested to support the container. The mutually facing surfaces of the diaphragms include protrusions which contact the container providing a fluid space between the container and the diaphragm. A leak testing device is then connected between the diaphragms so as to test for leakage of the container into the space between the diaphragms.

3,813,924
APPARATUS FOR CONTROLLING THE WITHDRAWAL FROM A CONDUIT OF THE LEADING ONE OF TWO SUCCESSIVE VOLUMES OF FLUIDS PASSING THERETHROUGH

Joram Agar, Alresford, England, assignor to Joram Agar & Company, Limited, Alresford, England

Filed Jan. 28, 1972, Ser. No. 221,609
Claims priority, application Great Britain, Feb. 8, 1971, 4177/71
Int. Cl. G01n *11/00*
U.S. Cl. 73—53 12 Claims

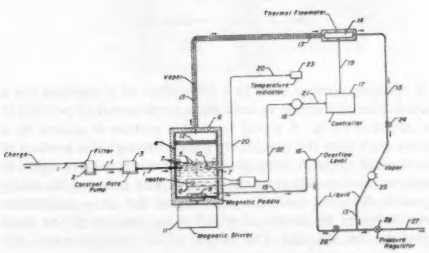


A method of detecting substitution, at a detection position, of one fluid flowing down a conduit for another, said method including the steps of measuring a predetermined physical characteristic of fluid passing said position; deriving at successive regular intervals of time difference values representative of changes in the measured quantity occurring in each interval, said intervals being short enough to ensure that changes during one such interval in said physical characteristic due to changes in ambient conditions are negligibly small; and noting the occurrence of a difference value exceeding a predetermined amount.

3,813,925
DETERMINATION OF THE TEMPERATURE REQUIRED FOR A PREDETERMINED VOLATILITY RATIO

Ellsworth R. Fenske, Palatine, and James H. McLaughlin, La Grange, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 6, 1972, Ser. No. 269,376
Int. Cl. G01n *7/18, 33/22*
U.S. Cl. 73—64.2 7 Claims

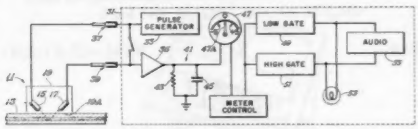


The temperature to which a liquid hydrocarbon feed stream must be heated to produce a given volume ratio of vapor produced to the original liquid is determined by monitoring the temperature of a vapor-liquid equilibrium formation zone. A constant rate of flow of the liquid to the zone is compared with the rate of flow of vapor from the zone, in which the temperature is adjusted until these rates are at the desired ratio.

3,813,926
ULTRASONIC PULSED ENERGY INSPECTION SYSTEM

Alfred W. Stubbeman, 3909A Westridge Ave., Fort Worth, Tex. 76116

Filed Feb. 9, 1972, Ser. No. 224,791
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.7 21 Claims

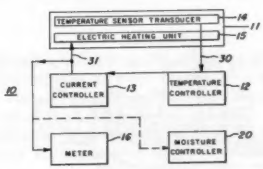


The specification discloses a system to be used with a pulsed acoustic transducer system for inspecting the bonds of bonded structure and comprises a summation circuit for producing an output representative of the algebraic sum of the received signals and a display system for visually displaying the output of the summation circuit. In addition there are provided a low limit gate and a high limit gate coupled to the output of the summation circuit for actuating an alarm system when the output of the summation circuitry falls below or rises above a preselected range to notify the operator of various conditions of a bond or bonds. The low limit gate and alarm also will warn the operator if there is a loss of couplant between the transducer and structure under evaluation or if the transducer is tipped.

3,813,927
MOISTURE TRANSDUCER

Leon M. Furgason, P.O. Box AK. 163rd S.W., Harlowton, Mont. 59036

Filed July 16, 1973, Ser. No. 379,238
Int. Cl. G01n *25/56*
U.S. Cl. 73—73 12 Claims



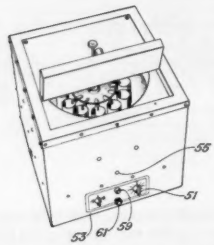
A moisture transducer utilizing a heated surface with a temperature sensor therein which is heated from an electrical resistor to a predetermined temperature level with the temperature sensor controlling a current controller to maintain the heated level in the plate or surface. As material having varying moisture contents pass across the same, a loss of heat from the surface due to the absorption of heat by moisture in the material will reflect a change in current to maintain the plate at a predetermined temperature level, such current being a measure of the moisture content of the material passing over the plate.

3,813,928

METHOD OF AND APPARATUS FOR SEPARATING MOISTURE FROM SOLIDS

Bazeel B. Anderson, Forth Worth, Tex., assignor to Anderson Laboratories, Inc., Ft. Worth, Tex.

Filed Apr. 18, 1972, Ser. No. 245,201
Int. Cl. G01n 5/02, 25/56
U.S. Cl. 73—76 2 Claims



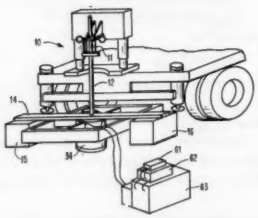
The specification discloses a method of testing and an apparatus for use in determining the moisture content or nonvolatile residue of material by spinning the material in a heated zone or chamber. During this operation, the material is held in cup-like containers which are spun in the heated chamber. The nonvolatile material is retained in the sample cups by the centrifugal force, thus avoiding loss due to spattering.

3,813,929

RESONANT FOOTING TEST APPARATUS

Bobby O. Hardin, and Woodrow W. Thurman, both of Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Mar. 27, 1973, Ser. No. 345,259
Int. Cl. G01h 1/10; G01n 3/22
U.S. Cl. 73—84 5 Claims



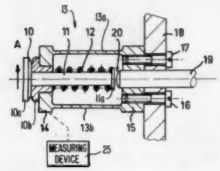
An apparatus for conducting resonant footing tests upon undisturbed soils includes an oscillatable mechanical structure with attachable electrical means for causing both oscillation of the structure and measurement of the behavior of the soil under test. The apparatus is transportable to the site at which the test is conducted on soil in-situ, and is adapted to be employed under selective loadings applied downwardly upon the oscillatable structure.

3,813,930

MEASURING HEADS FOR STRENGTH TESTERS

Horst Kleindienst, Uster; Gerold Roos, Esslingen, and Rudolf Zingg, Duebendorf, all of Switzerland, assignors to Zellweger Ltd., Uster, Switzerland

Filed Mar. 27, 1972, Ser. No. 238,334
Claims priority, application Switzerland, June 17, 1971, 8835/71
Int. Cl. G01n 3/04
U.S. Cl. 73—95.5 12 Claims



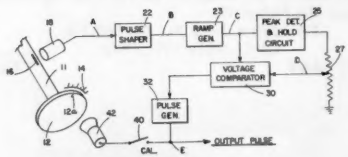
An improvement in measuring heads for yarn testers wherein a test clamp is mounted at the free end of a leaf spring arrangement whose other end is fixed so that the force applied to the test clamp can be measured by the amount of deflection of the leaf spring arrangement.

3,813,931

APPARATUS FOR PRECISELY INDICATING POSITION OF ROTATIONAL MACHINERY

Lyle V. Rennick, Mission Viejo, and William L. Mitchael, Fullerton, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Mar. 15, 1973, Ser. No. 341,703
Int. Cl. G01m 15/00
U.S. Cl. 73—116 5 Claims

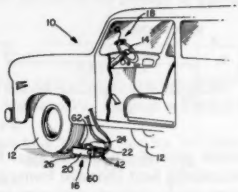


A rotating portion such as a drive shaft of a machine has a marker placed thereon to indicate a predetermined portion of the rotation cycle. A signal from this marker is sensed by a sensor each time the machinery passes through this portion of the rotation cycle. A ramp generator develops a ramp signal in response to the output of the sensor. The peak of the ramp signal is detected and this peak signal fed to a calibration potentiometer by means of which a percentage of the peak signal can be selected. The output of the potentiometer and that of the ramp generator are fed to a voltage comparator which triggers a pulse generator when the ramp reaches the voltage set on the potentiometer. The output of the pulse generator actuates a strobe light which is used to detect a marker on the machinery indicative of a precise rotational position, the potentiometer being adjusted until the strobe light is precisely synchronized with this marker. Thus a calibration is achieved whereby the output pulse precisely indicates a predetermined rotational position of the machinery. This output pulse can then be used with other measurement circuitry, without further requirement of the strobe light.

3,813,932
STEERING LINKAGE TESTING APPARATUS

Virgil T. Wallace, Box 831, Gladewater, Tex. 75647

Continuation of Ser. No. 883,392, Dec. 9, 1969, abandoned. This application June 22, 1971, Ser. No. 155,641
Int. Cl. G01m 17/06
U.S. Cl. 73—118 12 Claims

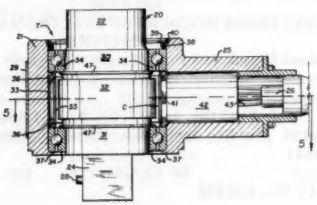


An apparatus for testing the play in the linkage between the steerable dirigible wheels and the steering wheel of a vehicle, comprises sensing means pivotally supported by a housing for engaging one of the dirigible wheels, an electric circuit including signal means, a source of electrical energy and switch means, the switch means including moveable control means actuated by the sensing means and cooperative with fixed energizing means supported by the housing. The signal means is operated when the control means is moved upon swinging movement of the sensing means. Means also are provided for indicating steering wheel travel, including means carried by the steering wheel and moveable relative to a fixed reference point.

3,813,933
DYNAMIC TORQUE INDICATORS

Lowell Warner Weiss, and Clendon Hart Fitzgerald, both of Denver, Colo., assignors to B. K. Sweeney Manufacturing Co., Denver, Colo.

Filed Feb. 2, 1972, Ser. No. 222,957
Int. Cl. G01l 5/10
U.S. Cl. 73—136 A 8 Claims



The present invention is a dynamic torque indicator for wrench systems. A rotor, carried within a rather short cylindrical housing has a driven socket connector projecting from one end of the housing and a driving socket stub projecting from the other end of the housing. The housing includes a radially extended arm from whence a conductor cable extends, as to a readout meter calibrated to indicate torque.

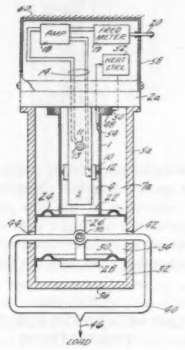
A transducer is positioned within the medial portion of the rotor to convert the torque applied to the rotor to an electrical signal. The transducer consists of piezo-electric crystals mounted between opposing arms upon the rotor. The piezo-electric crystals are connected to one element of a rotary capacitor consisting of a first axially centered cylinder embracing the rotor and a second like cylinder embracing the first cylinder. An amplifier, carried in the housing arm controls the strength of the electrical signal to provide an amplified signal of suitable strength at the readout meter.

Thus, when the dynamic torque indicator is interposed between a driven component and a drive component, torque will be applied to the rotor and this torque will be indicated directly upon the readout meter.

3,813,934
VIBRATING CYLINDER FORCE TRANSDUCER

Richard C. Meyer, Simsbury, Conn., assignor to United Aircraft Corporation, Hartford, Conn.

Filed Feb. 28, 1973, Ser. No. 337,230
Int. Cl. G01l 1/10
U.S. Cl. 73—141 R 4 Claims



A vibrating cylinder, which is electronically driven by a feedback amplifier in response to electromagnetic signals representing the vibrations thereof, is completely surrounded by vacuum and is axially loaded, in tension or compression, whereby the natural frequency thereof varies as a function of the force of axial loading. The loaded end of the cell is sealed to vacuum by a diaphragm. The loading means is connected to a diaphragm of equal area, atmospheric pressure against which loads the cell in a direction oppositely to the first diaphragm, whereby axial loading is equally independent of pressure and density effects. Thermostatic heating obviates temperature variations. A tension embodiment includes a hoop for loading the cylinder, and a compression embodiment comprises a beam-type suspended-pan scale.

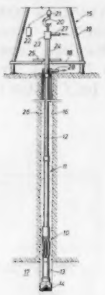
3,813,935
METHODS AND APPARATUS FOR DETECTING THE ENTRY OF FORMATION GAS INTO A WELL BORE

Denis R. Tanguy, 10 Lakeside Dr., and Joseph F. Kishel, Oak Ln., both of Clarks Summitt, Pa. 18411

Continuation-in-part of Ser. No. 105,885, Jan. 12, 1971, abandoned. This application Apr. 10, 1972, Ser. No. 242,320
Int. Cl. E21b 47/10
U.S. Cl. 73—153 52 Claims

As a preferred mode for practicing the invention disclosed herein, a discrete sample of drilling mud from the borehole is periodically trapped within an expansible sampling chamber defined between a pair of telescoping members coupled to a drill string adjacent to the drill bit. By moving the drill string so as to expand the sampling chamber, the pressure of the entrapped sample is reduced to at least the saturation pressure of a gas-containing drilling mud at the borehole ambient temperature. By measuring the force required to expand the sampling chamber, the presence or absence of formation gas in the drilling fluid can be determined; and, if desired, these force measurements may be used to derive quantitative measurements which are representative of the percentage of gas entrained in the discrete sample. In the representative em-

bodiments of the apparatus of the present invention disclosed herein, one or more unique sampling devices are arranged between the upper and lower telescoping members of a typical slip joint which is tandemly connected in the drill string preferably a short distance above the drill bit. Each of these

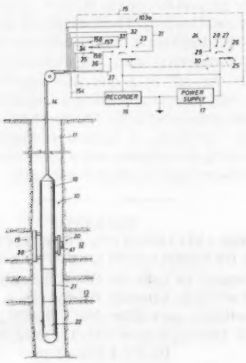


fluid samplers includes telescoping piston and chamber members defining an enclosed sample chamber which is expanded in response to extension of the slip joint members. Valve means are cooperatively arranged with each of the sampling devices for admitting a predetermined volume of drilling mud into the sample chamber each time the slip joint is extended.

3,813,936
METHODS AND APPARATUS FOR TESTING EARTH FORMATIONS

Harold J. Urbanosky, Pearland, and Frank R. Whitten, Houston, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,225
Int. Cl. E21b *49/00*
U.S. Cl. 73—155 **26 Claims**

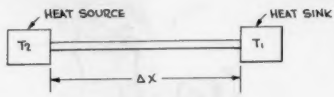


In the representative embodiments of the new and improved methods and apparatus for testing earth formations disclosed herein, fluid-admitting means are placed into sealing engagement with a potentially-producible earth formation and selectively-operable valve means on the fluid-admitting means are opened to place a filtering medium situated between the fluid-admitting means and a flow line in communication with the isolated formation. Then, before testing is commenced, well bore fluids are introduced into the flow line and discharged through the filtering medium in a reverse direction and into the earth formation for cleaning the filtering medium of potentially-plugging materials before connate fluids are introduced into the fluid-admitting means.

3,813,937
HEAT FLOW CALORIMETER

James C. Fletcher, and William V. Johnston, both of 20300 Fredrick Rd. No. 25, Germantown, Md.

Filed June 16, 1972, Ser. No. 263,498
Int. Cl. G01k *17/00*
U.S. Cl. 73—190 R **10 Claims**

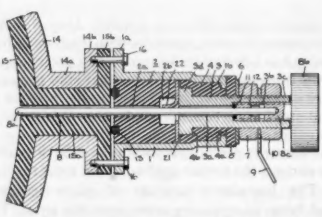


This invention generally relates to heat flow calorimeter devices for measuring heat liberated from or absorbed by an object and particularly concerns a calorimeter device capable of measuring the thermal output of sealed nickel-cadmium batteries or cells during charge-discharge cycles thereof. In the preferred embodiment, the invention contemplates the provision of a thermally isolated calorimeter vessel into which an object, such as a nickel-cadmium cell, is placed, heat exchange taking place between the object and the vessel. An elongated metal heat conducting rod is coupled between the calorimeter vessel and a heat sink, thus providing the only heat exchange path from the calorimeter vessel itself. Heater wires disposed within the calorimeter vessel supply additional heat to the vessel to maintain a constant temperature head therein or, more specifically, to maintain a constant temperature differential between the vessel and the heat sink. Any variation in the amount of heat supplied to the vessel and specifically any variation in power supplied the calorimeter vessel heater besides that necessary to maintain the constant temperature difference between the vessel and the heat sink is equal to the amount of heat liberated or absorbed by the object within the vessel itself, and means are provided for measuring this heater power. The apparatus is constructed into electrically insulated split halves so that the heat conducting rod and other components of the system are themselves utilized to conduct power to and from nickel-cadmium cell disposed within the calorimeter vessel.

3,813,938
ELECTRODE HOLDER FOR ELECTROMAGNETIC FLOWMETERS

Hermann Grosch, and Hans-Werner Oelbe, both of Gottingen, Germany, assignors to Fisher & Porter Company, Warminster, Pa.

Filed Dec. 4, 1972, Ser. No. 311,808
Claims priority, application Germany, Dec. 23, 1971, 2164111
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 EM **7 Claims**



An electrode holder for an electromagnetic flowmeter whose flow tube is provided with a lateral extension having a passage therein into which a metering electrode is insertable, the tip of the inserted electrode being in contact with the fluid

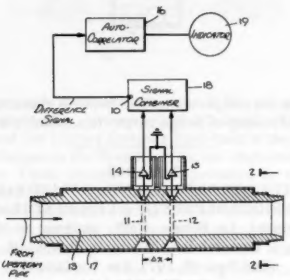
conducted through the tube. The holder includes a case which is attachable to the flow tube extension. A sealing support is housed within the case, the support having an electrode passage therein which registers with the passage in the flow tube extension. Disposed at the mouth of the electrode passage is a shut-off device which, when the electrode is inserted, is displaced to permit the electrode to enter the passage, but when the electrode is withdrawn, acts automatically to block the mouth of the passage to prevent leakage of fluid.

3,813,939

TAG-SENSING FLOWMETERS

Victor P. Head, Hatboro, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed May 7, 1973, Ser. No. 357,789
Int. Cl. G01p *5/08, 5/18*
U.S. Cl. 73—194 E **11 Claims**



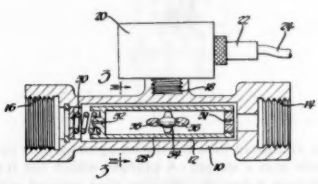
A tag-sensing flowmeter for fluids whice contain spatially-distributed random tags in the form of triboelectric charges, or in any other form that can be detected to produce a corresponding electric signal. The fluid is conducted through a passage having two tag-sensing stations separated by a known distance. The two signals produced at these stations are amplified and algebraically combined to yield a difference signal which is applied to an auto-correlator to ascertain the transit time of the tags between the two stations, thereby to determine the flowrate of the fluid.

3,813,940

FLOW METER WITH A BYPASS

Donald W. Sommer, Troy, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Dec. 18, 1972, Ser. No. 316,183
Int. Cl. G01f *1/10*
U.S. Cl. 73—198 **2 Claims**



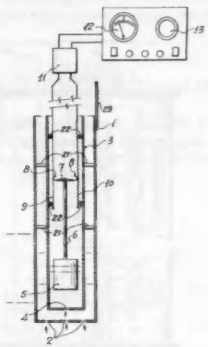
A flow meter for measuring minute flow rates in a conduit which at times can carry very large flows has a valve in the conduit which opens to the large flow but when closed directs the minute flow through the interior of the valve. Inside the valve, a magnetic turbine responds to the minute flows and activates a magnetic pick-up located in a well in a wall of the conduit.

3,813,941

MARINE LEVELMETER

Francisco Angel de Iturribarria Miguel, and Angel de Urruticoechea Zalbide, both of Uri Ctarte No. 8-6°, Bilbao, Spain

Filed Sept. 23, 1971, Ser. No. 183,009
Claims priority, application Spain, June 16, 1971, 392311
Int. Cl. G01f *23/10*
U.S. Cl. 73—313 **6 Claims**



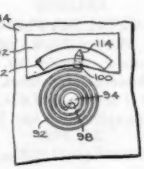
A marine levelmeter essentially constituted by an exterior tubular body whose lower end is closed by a cover in which there are made three orifices and within which there is concentrically situated an interior tubular body with the lower end closed by a cover in which there exists one single orifice, the said two bodies being maintained by means of complementary tie rods in such a position that between one and another there exists a permanent separation on all sides. Within the interior tubular body there is situated a float from which there rises a rod at the upper end of which, and electrically insulated from it, a metal crosspiece is fixed which has attached to its ends two sensing elements, sliding respectively over the smooth terminal of a pole and over a resistance in which there terminates the other pole of the electric conduction which, through a shunt or shunting resistor, terminates in a measuring apparatus situated on the deck of the vessel.

3,813,942

WASHING APPLIANCE WITH TEMPERATURE INDICATING MEANS

Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 26, 1972, Ser. No. 318,389
Int. Cl. G01k *13/02, 5/64;* **B08d** *3/00*
U.S. Cl. 73—343 R **9 Claims**



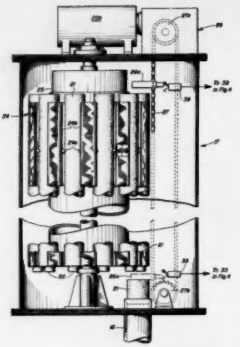
The present invention comprises means in an automatic washing machine for sensing internal washing liquid temperature, registering a reading of such temperature, and holding the registered reading after completion of the operational cycle whereby the operator of the machine can determine, when washed items are later removed from the machine, if faulty washing performance may have been due to insufficient heat in the washing liquid.

3,813,943

APPARATUS FOR INSERTING AN EXPENDABLE SENSOR INTO A BASIC OXYGEN FURNACE

Ronald J. Fradeneck, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 3, 1972, Ser. No. 231,675
Int. Cl. G01k *1/14*
U.S. Cl. 73—343 R **3 Claims**



Improved apparatus for positioning a temperature sensor, such as an expendable immersion thermocouple and a liquidus arrest carbon device in a lance. The apparatus includes a sensor housing and a downwardly extending sensor lance connected to and communicating with the housing. The housing contains a rotatable sensor storage means, a variable-stroke sensor feeder means, and electrical means to power the variable stroke feeder means and limit its upper and lower movement. The electrical means is connected to external control circuitry which is responsive to the presence or absence of thermocouple wiring connections between the sensor and lance tip to automatically feed and position the sensor in the lance tip. A recorder is connected to the thermocouple and liquidus arrest carbon device in the lowermost sensor by means of sensor contacts wiping stationary contacts in the lance tip. A sensor positioned in the lance tip can be inserted into a ferrous bath in a refining furnace, such as a basic oxygen furnace, to determine the temperature and/or carbon content thereof.

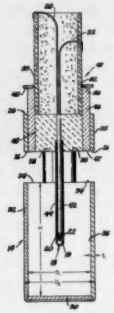
3,813,944

MOLTEN METAL SAMPLING DEVICE

Edward F. Ryntz, Jr., Warren, Mich.; John F. Janowak, Defiance, Ohio, and John F. Watton, Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 147,836, May 28, 1971, Pat. No. 3,670,558. This application Apr. 17, 1972, Ser. No. 244,596
Int. Cl. G01k *13/12*; G01n *25/02*
U.S. Cl. 73—354 **8 Claims**

A molten metal sampling device adapted for immersion in a heat of molten cast iron treated to form nodular iron on solidification to obtain a sample therefrom upon withdrawal and to generate a cooling curve thereof is disclosed. The device comprises a cylindrical cartridge having vertical walls and a base with a molten metal inlet opening in the vertical walls defining a sampling portion of the cartridge adapted to be filled with molten metal upon immersion to obtain the sample, and a thermocouple extending into the sampling portion having its thermal junction located at the approximate thermal center of the sample for measuring the change in temperature



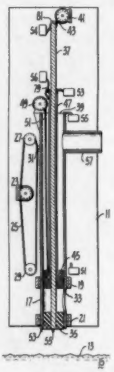
with time as the sample cools. The device is characterized by a critical relationship of design parameters, which are defined.

3,813,945

APPARATUS FOR EXTRACTING A LIQUID SAMPLE AT VARIOUS DEPTHS OF A LIQUID STREAM

Jimmie Crumal, La Honda, Calif., assignor to Nielsen Engineering & Research Inc., Mountain View, Calif.

Filed Nov. 19, 1971, Ser. No. 200,403
Int. Cl. G01n *1/14*
U.S. Cl. 73—422 TC **13 Claims**

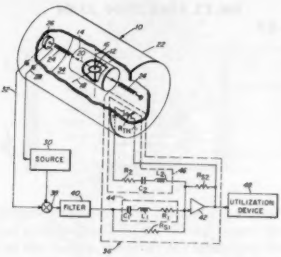


A hollow elongated tube having an opening near its lowest end descends into a stream. A plunger within the tube normally positioned below the opening rises upward within the tube after the tube reaches the bottom of the stream to force a liquid sample out the top of the tube. A second plunger may be employed within the tube normally positioned above the opening to act as a pump plunger descends through the stream of liquid. The pump plunger travel may be controlled as a function of height of the opening of the tube within the stream in order to obtain a liquid sample that contains various constituents in the same proportion as the liquid stream.

3,813,946
TEMPERATURE COMPENSATING CIRCUIT

Frederick L. Robbins, Jr., Tewksbury, and Paul J. Suprenant, Chelmsford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 3, 1971, Ser. No. 195,351
Int. Cl. G01d *11/12*
U.S. Cl. 73—430 **4 Claims**

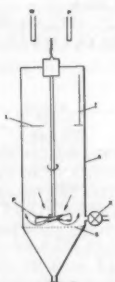


A temperature compensating circuit for use with a fluid damped measuring instrument is disclosed. Temperature variations of the viscous damping fluid used in the instrument produce changes in the dynamic response characteristic of the instrument. These changes are compensated by including in the temperature compensating circuit a temperature sensitive element, the electrical value of which varies in accordance with the temperature of the viscous damping fluid. The temperature compensating circuit is responsive to the signal produced at the output of the measuring instrument and the dynamic response characteristic of such circuit is a function of the electrical value of the temperature sensitive element. The dynamic response of the temperature compensating circuit varies with changes in temperature so that the characteristic of the signal produced at the output of such circuit in response to a parameter being measured by the measuring instrument is invariant with such changes in temperature.

3,813,947
WET SIEVING

Adrian L. Hinde, Johannesburg, South Africa, assignor to Chamber of Mines Services (Properties) Limited, Johannesburg, South Africa

Filed Jan. 4, 1973, Ser. No. 320,890
Claims priority, application South Africa, Jan. 11, 1972, 72/0191
Int. Cl. G01n *5/04, 15/00*
U.S. Cl. 73—432 PS **4 Claims**

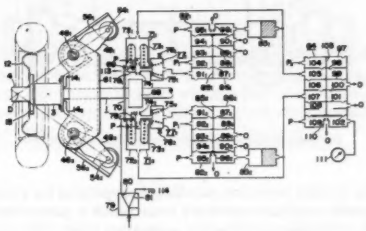


In a wet sieving process a vessel is used that has a sieving screen as a false bottom. The vessel is filled up to a predetermined level with clear water and its mass is determined. Then the vessel is filled to the same level with a slurry containing the solids to be sieved and weighed again. Fine solids and liquid are then washed through the screen with the addition of further liquid until essentially clear liquid passes through the screen. The vessel is again filled with clear liquid and its mass is determined. By means of the Archimedean principle one can then determine the mass of solids in the original sample, the mass of solids remaining after the screening process and the mass of solids which has passed through the screen.

3,813,948
APPARATUS FOR DETECTING UNBALANCE IN A WHEEL

Jinichi Ito, Tokyo, Japan, assignor to Yamada Yuki Seizo Co., Ltd., Sagamihara City Kanagawa Pref., Japan

Filed Aug. 9, 1972, Ser. No. 279,229
Int. Cl. G01m *1/16*
U.S. Cl. 73—460 **10 Claims**



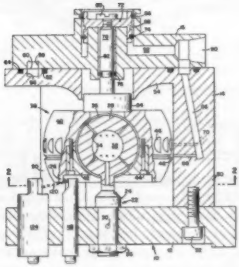
This invention relates to an apparatus for detecting unbalance in a wheel.

Said apparatus comprises a rotary shaft adapted to vibrate radially thereof, said rotary shaft mounting thereon a wheel to be tested for unbalance, and means for supporting said rotary shaft such that the instantaneous center of vibration of the rotary shaft can be set at a side surface of the wheel to which an adjusting weight is to be attached.

3,813,949
LIGHT ACTUATED SOLID STATE PICKOFF

Aubrey Rodgers, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1973, Ser. No. 328,988
Int. Cl. G01c *19/28*
U.S. Cl. 74—5.6 A **4 Claims**



A light actuated two degree of freedom gyro in which light sources and light position sensors are mounted on the stator in facing relation with a portion of the rotor blocking the light source to the light position sensors as the rotor deviates from a

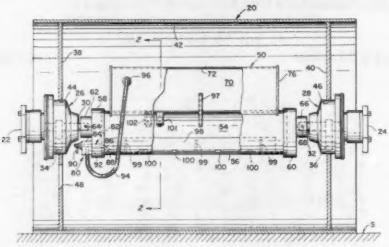
predetermined position. As the rotor drifts from the predetermined position, more or less light is sensed by the light sensors which in turn causes electrical signals to be generated. The generated signals are then used to control mechanism to cause the stator to be adjusted relative to the rotor.

3,813,950

APPARATUS FOR PRODUCING VARIABLE AMPLITUDE VIBRATORY FORCE

D. Henry Ebersole, Springfield, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Filed Oct. 19, 1972, Ser. No. 299,059
Int. Cl. F16h *33/00*
U.S. Cl. 74—61 **30 Claims**



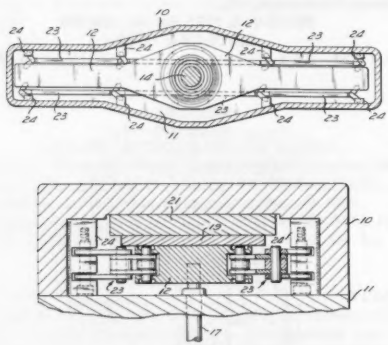
The present invention provides an apparatus for producing a variable amplitude vibratory force which is particularly useful as a rotatable eccentric for a vibratory roller. The rotatable eccentric comprises first and second eccentric fluid chambers rotatable about a common axis of rotation, and adjustable valve means interconnecting the chambers for controlling the amount of fluid transfer between the chambers upon rotation of the eccentric to produce a variable amplitude vibratory force.

3,813,951

STABILIZING MEANS FOR MULTIPLE SPINDLE DRIVE

Frank G. Zagar, 19930 Edgecliff Dr., Euclid, Ohio 44119

Filed Jan. 24, 1973, Ser. No. 326,235
Int. Cl. F16h *25/08*
U.S. Cl. 74—63 **3 Claims**



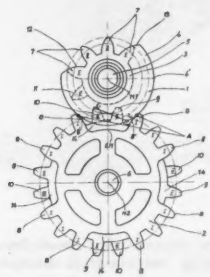
The oscillator plate of a gearless multiple spindle drive head is constrained in its non-rotative circular translatory motion by parallel motion linkages at each of difference sides of the oscillator plate with the driving connection to the plate being at the center of the plate.

3,813,952

ROTARY STEPPING MECHANISM WITH CYLINDER LOCK ARRANGEMENT

Wolfgang Fehrenbacher, St. Georgen, Germany, assignor to Kieninger & Obergfell, Fabrik fur technische Laufwerke and Apparate, St. Georgen, Black Forest, Germany

Filed Mar. 5, 1973, Ser. No. 338,413
Claims priority, application Germany, Mar. 6, 1972, 2210701
Int. Cl. F16h *27/04, 55/04*
U.S. Cl. 74—84 **8 Claims**



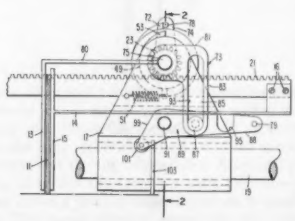
A toothed-wheel mechanism for clocks or like small-size precision devices (e.g., stepping mechanisms) comprises a first (driven) toothed wheel having a tooth periphery extending all around the same at least in one plane of the toothed wheel, thereby forming a gear thereof. In another plane thereof, the periphery is formed with gaps flanked by respective teeth, preferably with two or more foreshortened teeth being disposed between successive gaps. A second (driving) toothed wheel is provided with a cylinder segment receivable in the gaps and extending over only part of the periphery thereof of the second wheel while a tooth segment extends over another portion of the periphery of this second wheel for mating engagement with the intergap teeth of the first wheel and of the same intertooth spacing or pitch. The teeth flanking the gap receiving the cylinder segment lie tangent-thereto so that the first wheel is immobilized while the cylinder segment of the second wheel is received in a gap of the teeth of the first.

3,813,953

LINEAR TO LINEAR MOTION APPARATUS INCLUDING A BIDIRECTIONAL SPRING CLUTCH HAVING MEANS TO INHIBIT AUTOMATIC SHIFTING

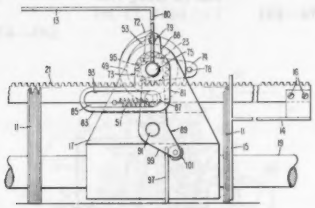
Edward A. Wojtowicz, Bryn Mawr, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 27, 1972, Ser. No. 319,091
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.17 **10 Claims**



A linear to linear motion apparatus utilizing an output member slidably mounted on a shaft with an input member of

circular cross section journalled therein, an elongated rack running through the output member parallel to the shaft and geared to the input member, and a bidirectional spring clutch controlling the relative motion of the input and output members. The clutch comprises a pair of left-hand wound helical springs, oppositely coiled on respective aligned surfaces of the



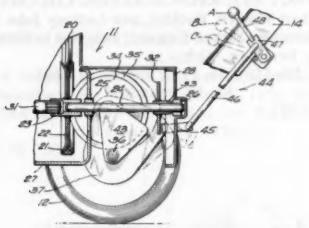
input and output members, controlled by a shifter sleeve, and a third helical spring coiled on the shifter sleeve and an adjoining surface of the output member for inhibiting the automatic shifting of the sleeve. The rack can be run through the output member unidirectionally in either direction, or locked to the output member for advancing it unidirectionally in either direction, as determined by the state of the clutch.

3,813,954

FRICTION DRIVE WITH AXIALLY SPACED DISKS AND INTERMEDIATE SHIFTABLE WHEEL

Warren H. Price, Sheboygan, and Lynn E. Hochwitz, Plymouth, both of Wis., assignors to Gilson Bros. Co., Plymouth, Wis.

Continuation of Ser. No. 101,471, Dec. 28, 1970, abandoned.
This application Sept. 7, 1972, Ser. No. 287,134
Int. Cl. F16h *17/00, 15/08*
U.S. Cl. 74—194 **3 Claims**



Drive train comprising a shaft having axially spaced friction disks and an intermediate shiftable friction wheel selectively engageable with one or the other of said disks, thus to afford relative rotation of the disks and the wheel selectively in opposite directions, depending on which disk is contacted by the wheel.

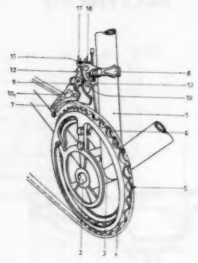
3,813,955

DEVICE FOR THE ACCURATE CONTROL OF TRANSLATORY MOVEMENT AND IN PARTICULAR OF THE TRANSLATORY DISPLACEMENT OF A BICYCLE CHAIN FROM ONE CHAIN WHEEL TO THE OTHER

Jacques Andre Huret, and Roger Henri Marius Huret, both of 60, Avenue Felix Faure, Nanterre (Hauts de Seine), France

Filed June 26, 1972, Ser. No. 266,178
Claims priority, application France, Sept. 17, 1971, 71.33637
Int. Cl. F16h *1/00*
U.S. Cl. 74—217 B **5 Claims**

The invention relates to a device for the accurate control of translatory movement and in particular of the translatory displacement of a bicycle chain from one chain wheel to the other this device consisting of a deformable parallelogram of which one of two opposite branches consists of a fixed support and the other of the means of effecting translatory displacement, one of the other two opposite branches consisting of a



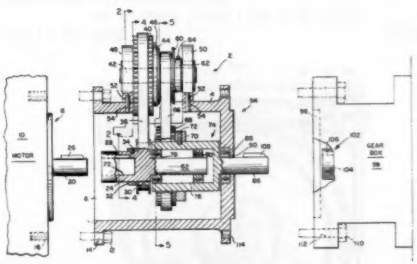
rod articulated by its ends on the fixed support and the translatory displacement control device, and the other by a part in the shape of an arc of a circle, which is part of the fixed support and which supports the means for effecting translatory displacement.

3,813,956

SPEED CHANGER

Alten E. Whitecar, Westville, N.J., assignor to Smithkline Corporation, Philadelphia, Pa.

Filed Mar. 14, 1973, Ser. No. 341,073
Int. Cl. F16h *7/00, 9/04*
U.S. Cl. 74—219 **8 Claims**



A modular speed changer has an input shaft, an output shaft coaxial with the input shaft and mounted for rotation relative to the input shaft and a rotatable jack shaft parallel to the input and output shafts. The speed changer has a speed changing train comprising a first sprocket secured to the input shaft and a second sprocket secured to the jack shaft with a timing belt connecting said sprockets, a third sprocket secured to the jack shaft, and a fourth sprocket secured to the output shaft with a timing belt connecting these last two mentioned sprockets. The jack shaft is mounted for ready removal to provide for the rapid changing of sprocket ratios.

3,813,957

DEVICE FOR GUIDING CABLES ON CYCLES

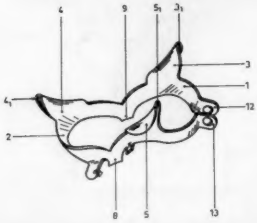
Roger Henri Huret, and Jacques Andre Huret, both of 60, Avenue Felix Faure, Nanterre (Hauts-de-Seine), France

Filed June 30, 1972, Ser. No. 267,818

Claims priority, application France, Jan. 24, 1972, 72.02271

Int. Cl. F16h 7/18

U.S. Cl. 74—240 7 Claims



The invention relates to a device for guiding cables on cycles which is simple to fit and robust, the device consisting of a collar provided with guides for the passage of cables, the collar having two obliquely opposite flanks, and the cable guides being formed by folding over the tongues provided on the collar.

3,813,958

LOCKING DEVICE FOR A WINDING ARRANGEMENT

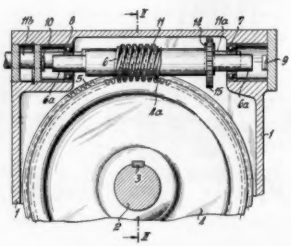
Hans Meyer, Holzheim near Neuss, Germany, assignor to GFA-Antriebstechnik Gesellschaft mit Beschraenkter Haftung, Dusseldorf, Germany

Filed May 4, 1973, Ser. No. 357,339

Claims priority, application Germany, May 8, 1972, 2222503

Int. Cl. F16h 1/16, 57/10

U.S. Cl. 74—425 8 Claims



A roller blind or the like is wound on a winding shaft by means of a drive shaft, a worm on the latter and a worm gear fixed to the winding shaft, whereby the unwound portion of the blind will exert a moment of the winding shaft opposite to the moment imparted thereto by the drive shaft. This moment is counteracted by the self-locking worm drive between the drive shaft and the winding shaft. A locking device comprising an auxiliary self-locking worm drive is provided which becomes active after destruction of the worm drive between the drive shaft and the winding shaft to prevent in such a case accidental lowering of the roll blind.

3,813,959

MICROSCOPE MANIPULATOR

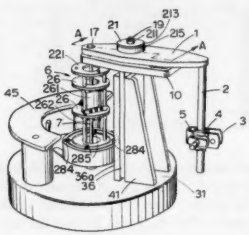
Arthur E. Saunders-Singer, 10, Mount Pleasant, Reading, England

Filed July 7, 1972, Ser. No. 269,780

Claims priority, application Great Britain, July 14, 1971, 32974/71

Int. Cl. G05g 9/00

U.S. Cl. 74—491 5 Claims



A movement reduction apparatus comprising first and second plates which are supported in parallel relationship for the movement of the first plate, which carries a manipulator, relative to the second plate under the action of an operating member which cooperates with each plate by way of a respective ball joint and is handled by the operator.

3,813,960

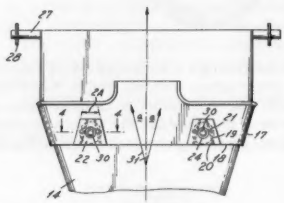
ENERGY ABSORBING STEERING COLUMN

Robert Michael Windett, Hockley, and Anthony John Martin, Southend-on-Sea, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1972, Ser. No. 318,294

Int. Cl. B62d 1/18

U.S. Cl. 74—492 7 Claims



This disclosure relates to an energy absorbing steering column assembly and support structure, and more particularly to a breakaway support bracket. According to the presently preferred embodiment, a bracket connected to the steering column has rearwardly opening recesses with rearwardly diverging edges. Slugs with shearable plastic inserts engage the diverging edges and are secured to a vehicle body structure. Under a forwardly directed impact load, the plastic material will shear and the bracket will be free to move forwardly relative to the slugs and the body structure.

3,813,961

SAFETY STEERING ARRANGEMENTS FOR MOTOR VEHICLES

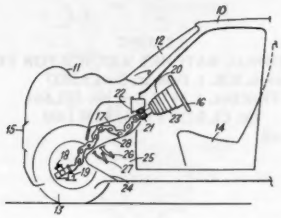
Karl Hug, Lenzhahner, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 9, 1973, Ser. No. 339,740

Claims priority, application Germany, Mar. 16, 1972, 2212713

Int. Cl. B62d 1/18

U.S. Cl. 74—492 9 Claims



A safety steering arrangement for a motor vehicle utilises a steering shaft, or a rectilinear portion of the steering shaft, formed with depressions which provide local alteration of the cross-sectional shape so as to form preferential yield regions for lateral buckling of the rectilinear portion, corresponding to shortening of the steering shaft, at a predetermined critical loading, corresponding to the influence of a frontal impact force on the vehicle. Thus a tube portion initially of circular cross-section may be formed with flattened portions which are spaced longitudinally from one another and are staggered circumferentially, such flattened portions providing local cross-sectional shapes which may be generally oval, or D-shaped, or flat pinch regions such that diametrically opposite wall regions of the tube contact each other, or of hour-glass configuration.

3,813,962

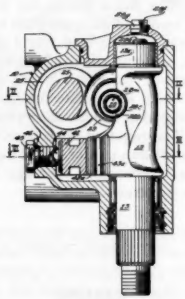
STEERING APPARATUS AND METHOD OF MAKING SAME

Arthur E. Bishop, 24 Brinker Rd., Barrington, Ill. 60010

Continuation of Ser. No. 7,117, Jan. 30, 1970, abandoned. This application Feb. 22, 1972, Ser. No. 227,727

Int. Cl. B62d 1/20; F15b 9/10

U.S. Cl. 74—500 23 Claims



A compact hourglass worm and roller power steering gear incorporating a one-eared cross-shaft support for the roller and novel power transfer gear tooth forms for the application of power to the cross shaft from a hydraulic cylinder, and incorporating an optimum roller mesh adjustment. An improved method of cross shaft gear manufacture incorporating broach tooling is provided.

3,813,963

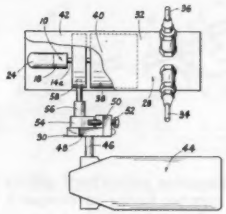
LOST MOTION ADJUSTMENT DEVICE FOR RECIPROCAL ELEMENTS

Stewart W. Wortley, 1814 S. Cheyenne, Tulsa, Okla. 74119

Filed Oct. 2, 1972, Ser. No. 294,090

Int. Cl. F01b 31/14; F15b 15/24

U.S. Cl. 74—828 5 Claims



A lost motion adjustment device for reciprocal elements including a movable block or body engagable with the reciprocal element for transmitting movement thereto, and an adjustment assembly cooperating with the movable body for selectively controlling the timing of the stroke of the reciprocal element.

3,813,964

CONTROL SYSTEM FOR AN AUTOMOTIVE AUTOMATIC POWER TRANSMISSION

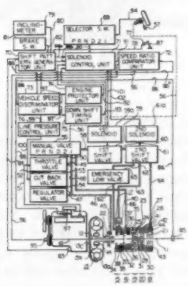
Hirohisa Ichimura, and Namio Irie, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 80,311, Oct. 13, 1970, abandoned. This application Sept. 29, 1972, Ser. No. 293,472

Claims priority, application Japan, Oct. 18, 1969, 44-83062; Nov. 4, 1969, 44-87728

Int. Cl. B60k 21/00; F16h 3/74, 47/00

U.S. Cl. 74—866 8 Claims

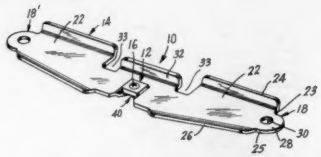


A control system for an automative automatic power transmission of a motor vehicle in which two shift valves are provided for controlling friction elements to provide a plurality of gear ratios. Each of the shift valves has two principal positions which are combined so as to selectively pass a fluid pressure from a source of fluid pressure to servo mechanisms of friction elements for thereby establishing desired speed ratio.

3,813,965
GARDEN TOOL SHARPENER

Carl Christian Stoutenberg, Avon, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jan. 8, 1973, Ser. No. 321,862
Int. Cl. B21k *11/00*
U.S. Cl. 76—82 8 Claims

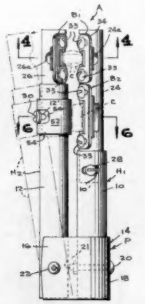


A sharpener for sharpening garden tools and the like comprises an elongated member having an elongated, generally planar body portion. A notch is formed intermediate the length of one of the side margins which define the longitudinal axis of the body portion, the notch having sidewall portions diverging outwardly from the base thereof. The elongated member has flanges along at least portions of the side margins of the body portion to either side of the notch so as to provide surfaces for manually gripping the sharpener during use thereof. A sharpening bit is detachably mounted on the body portion of the elongated member with a portion thereof extending over the notch base so as to be exposed for contact with a tool inserted in the notch. With the sharpening bit so mounted both surfaces of a tool defining a cutting edge may be sharpened by contact with the overlying portion of the sharpening bit without requiring reversal of either the tool or the sharpener.

3,813,966
ELECTRICIANS WIRE STRIPPING TOOL

Everett F. Knuth, 814 16th Ave., N.E., Rochester, Minn. 55901

Filed Feb. 13, 1973, Ser. No. 332,231
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.5 B 21 Claims

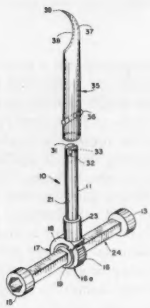


An electrician's hand-operated cutter tool for simplifying and readily facilitating the removal of at least one side and preferably both sides or edges of the protective plastic sheathing or multiple wire electrical cable without damaging the electrical insulation on the individually insulated wires within various forms of feeder cable such as that designated in the trade as UF and NMC cable. The tool is designed to cut a relatively wide strip of the usually thermoplastic type of material which serves as a combined cable sheath and web separator between adjacently disposed multiple conductors and a ground wire, thereby making it relatively easy for the remaining sheath to be pulled away from the wires and excised at the starting point of the stripping cut. The tool is of diversified character so as to be able to selectively cut away both of the opposed wide flat sides, or only the opposed narrow sides of the cable in instances where the ground wire may be too closely disposed to the sheath covering that it interferes with or is subject to being seriously defaced or severed by the stripping action.

3,813,967
UNIDIRECTIONAL RATCHET WRENCH FOR VEHICLES

Lyman De Haven, R.R. 1, Delmar, Iowa 52037

Filed Dec. 4, 1972, Ser. No. 311,661
Int. Cl. B25b *13/46*; B25f *1/00*
U.S. Cl. 81—60 1 Claim



A hand held unidirectional socket ratchet wrench and more particularly to a wrench useful for securing in place or unscrewing the nuts or lag screws which reliably secure vehicle wheels to the hub, comprises a commercially standard unidirectional ratchet with a complimentary mating means for fitting to a desired handle. The unidirectional ratchet is removably, securely and solidly affixed approximately midway to a square shaft. The square shaft is provided with a socket drive in both ends, said socket drives accepting commercially available sockets. The fitted handle for the complimentary mating ratcheting means which is securely hinged to said mating ratcheting means and provided with a locking means during use. The hinge, when unlocked allows handle to be folded, and is a circular rod of reasonable length with a slot and slot key, on free end which is opposite the hinged end. The slot and slot key on said end of handle, allows easy attachment of a handle extension if so required. Functions of said handle extension are to pry off hub cap or wheel cover, and when attached to handle, allow more leverage to be applied in removal of nuts or lag screws.

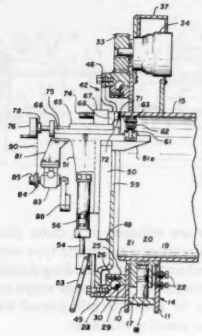
3,813,968
PIPE BEVELING APPARATUS

Robert Thomas, Houston, Tex., assignor to Big Three Industries, Inc., Houston, Tex.

Filed Apr. 12, 1972, Ser. No. 243,151
Int. Cl. B23b *3/22*
U.S. Cl. 82—4 C 10 Claims

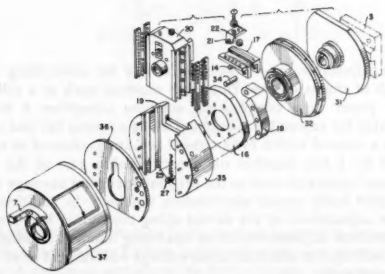
Apparatus for beveling the ends of pipes preparatory to the welding of pipe sections together end-to-end, or preparatory

to welding pipe sections to other objects. A hydraulic ran assembly holds the pipe stationary, while a traveling cutting



head rotates around the periphery of the pipe to cut a bevel on the pipe end.

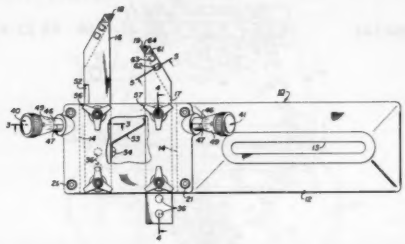
3,813,969
TOOL HOLDER FOR BORING AND TURNING POLYGONAL SHAPED SURFACES
Harold E. Wheeler, 119 N. Elmira St., Athens, Pa.
Filed May 11, 1971, Ser. No. 142,179
Int. Cl. B23b *5/44*
U.S. Cl. 82—19 **8 Claims**



A polygonal box tool for use with lathes or other machine tools of the character wherein the work is rotated about its axis. The box or housing is provided with a holder for a cutting tool, movement of the holder transversely of the box being controlled by a cam member journaled in the body portion of the box. The cam is driven by the lathe spindle, and is formed with a groove of contour to generate the desired shape on or in the workpiece.

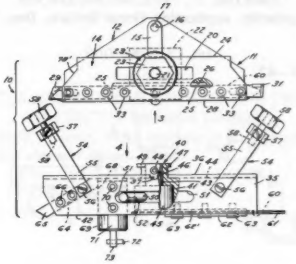
Variation of the size of the polygonal work surface is accomplished by means of an adjustable cam follower pin fitted into the groove of the cam. As the cam revolves, it imparts a reciprocatory motion to the tool holder, with respect to the center of the work.

3,813,970
TOOL HOLDER
Wallace F. Mitchell, Arlington Heights, Ill., assignor to Ammco Tools Inc., North Chicago, Ill.
Filed Jan. 10, 1972, Ser. No. 216,484
Int. Cl. B23b *29/00*
U.S. Cl. 82—36 R **6 Claims**



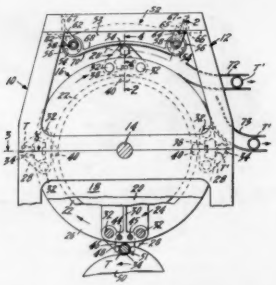
A pair of tool bars are mounted on a support member for respective pivotal movement toward or away from a workpiece, the tool bars also being held in longitudinally adjustable positions on the support member by the same pivot members about which they are pivotally movable.

3,813,971
QUICK CHANGE TOOL HOLDER
Savarian F. Lemanski, 109 Taylor Ave., Detroit, Mich. 48202
Filed May 30, 1972, Ser. No. 258,097
Int. Cl. B23b *29/00*; **B26d** *1/00*
U.S. Cl. 82—36 R **10 Claims**



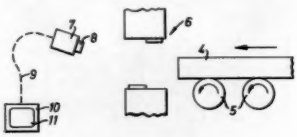
The two-part tool holder comprises a pair of block-like body members, one a main member at which the holder is fixedly attached to a machine tool support, and the other an auxiliary or secondary body member. These members have means enabling them to be quickly and easily clamped releasably in side-by-side relation to one another, comprising a rotary wedge device carried by the auxiliary part, which device includes an enlarged wedge head operatively engageable in parallel undercuts of the main body part, thus to exert lateral wedging force drawing the holder parts tightly together. Supplemental swing arm clamps complete the releasable interlock of the main and body components in assembly. Each of the latter has provisions to mount machining cutters of various types in a way to project from opposite ends or sides thereof. Importantly, the two body parts include means enabling the same to be mounted in 180° reversed positions in relation to one another, thereby enabling the tool elements to be operationally brought into play on a workpiece without necessarily dismounting the entire composite holder from the machine tool.

3,813,972
CUTTING MEANS
Earl Roger Van Alsburg, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.
Filed Jan. 4, 1973, Ser. No. 320,898
Int. Cl. B23b 5/14
U.S. Cl. 82—82 **7 Claims**



Improved cutting means for an inside-out tube cutting apparatus, including a plurality of small, free-wheeling cutter wheels eccentrically mounted in the surface of, and each having its axis parallel to that of, its mandrel. Preferably, the wheels are pin-mounted in a longitudinal groove in the surface of the mandrel.

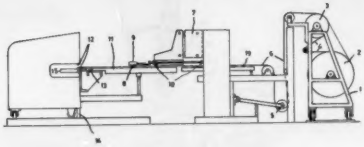
3,813,973
CROPPING METAL SECTIONS TO LENGTH
Keith Trevor Goodchild, and Harold Edward Merrill, both of Wolverhampton, England, assignors to British Steel Corporation, London, England
Filed Dec. 27, 1972, Ser. No. 318,905
Claims priority, application Great Britain, Dec. 28, 1971, 60265/71
Int. Cl. B26d 7/00
U.S. Cl. 83—42 **8 Claims**



A method of cropping a red-hot bloom by televising the end surface of the bloom and evaluating from the image the amount by which the bloom should be cropped back in dependence on any irregularities shown so as to produce a bloom sound throughout its length. Cropping back by the requisite amount may be effected in a number of successive stages.

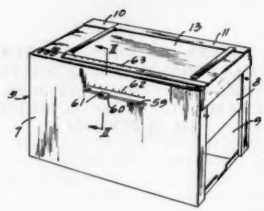
3,813,974
APPARATUS FOR CUTTING OF STEEL CORD FOR TIRES
John Inge Ronnie Friberg, and Sture Fingal Esaias Fritjofsson, both of Gislaved, Sweden, assignors to N. V. Veluwse Machine Industrie, Netherlands
Filed Sept. 13, 1972, Ser. No. 288,805
Claims priority, application Sweden, Sept. 14, 1971, 7111623
Int. Cl. B65h 17/36
U.S. Cl. 83—155 **4 Claims**

Apparatus for cutting of steel cord in strips for tires, characterized by the fact that the band-like cord in its fore end is grasped from above by vacuum suction cups in a feeding device and is at first lifted from a feed table and is fed by a horizontal movement forward to the required length, is let down, and then by means of another series of vacuum suction cups, held from underneath in its advanced position, which



latter suction cups are situated at a close distance from the final stage cutting shears of a guillotine type which are adjustable to form a desired angle to the feeding direction of the cord band, whereafter the cut-off steel cord strips are deposited on a feed-out band to be subsequently joined together and are finally rolled up in a winding machine.

3,813,975
ADJUSTABLE CUT-OFF GAUGING DEVICE
David F. Wolff, Glen Ellyn, Ill., assignor to Yorktown Industries, Inc., Addison, Ill.
Filed June 19, 1972, Ser. No. 263,856
Int. Cl. B26d 5/00
U.S. Cl. 83—205 **17 Claims**

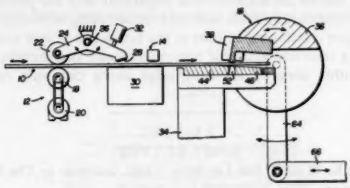


An adjustable cut-off gauging device for controlling the length of sheets derived from web material such as a roll of copy paper in a copymaking machine comprises a body mounted for adjustable movement along a runner bar and carrying a control switch for a cut-off actuating solenoid as triggered by a trip member on a reciprocable part of the associated apparatus such as the original document carriage of a so-called book copier electrostatic machine. In addition to major adjustments of the device along the runner bar, minor incremental adjustments of an operating handle are adapted to be effected to attain accurate settings with respect to an adjustment scale.

3,813,976
PHOTOGRAPHIC PRINT CUTTER
Jimmy E. Greer, South Lyon, Mich., assignor to Guardian Industries Corporation, Northville, Mich.
Filed June 20, 1973, Ser. No. 371,639
Int. Cl. B26d 1/38
U.S. Cl. 83—211 **4 Claims**

A cutter conversion unit for use in a high speed system for severing individual photographic prints from a continuous strip of such prints, permitting conversion of an existing system from one which cuts conventional bordered style prints to one which punches out a chaff strip shaped to create a borderless and round-cornered print. The conversion unit,

adapted to be actuated by an existing reciprocating link, comprises an oscillating "I"-shaped punch which automatically



strokes along an arcuate path in response to a signal from a sensing system when the strip is properly positioned and clamped beneath the punch.

3,813,977

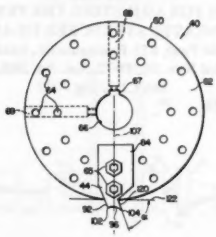
APPARATUS AND METHOD FOR CUTTING HOLES IN ROOFING SHEET MATERIAL

Edwin Ernst Hibbing, Castle Rock, Colo., and Frank Preisler, South Bound Brook, N.J., assignors to Johns Manville Corporation, Greenwood Village, Colo.

Filed Sept. 7, 1972, Ser. No. 287,117

Int. Cl. B23d 25/12; B26d 1/56

U.S. Cl. 83—345 **8 Claims**



Apparatus for punching holes in sheet material is provided. At least one cutting knife is mounted for rotation about a first axis. A punching surface of the knife includes end edges that protrude further from the axis than the side edges of the punching surface to permit the end edges to penetrate the sheet material before the side edges sever the sheet material. A cylindrical roll having a groove extending about its circumference is mounted for rotation about a second axis that is parallel to said first axis. The groove forms a pair of continuous cutting edges positioned in cooperative shearing relationship with the side edges of the punching surface of the knife. The new cutting method performed by the apparatus comprises first penetrating the sheet material with the end edges of the punching surface of the knife to form end cut lines which are longitudinally spaced in the sheet material, and then shearing the sheet material along a pair of side cut lines with each side cut line connecting a pair of laterally aligned ends of the end cut lines.

3,813,978

PUNCHING APPARATUS

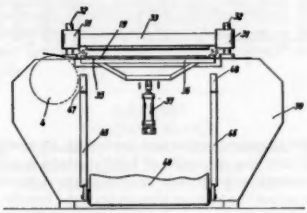
Ernst Maximilian Spengler, Huesenstamm near Offenbach am Main, Germany, assignor to Stanzlechnik GmbH Roeder & Spengler, Bergen-Enkheim, Germany

Division of Ser. No. 32,294, April 27, 1970, Pat. No. 3,703,118. This application Apr. 10, 1972, Ser. No. 242,740

Claims priority, application Germany, May 7, 1969, 6918475[U]; Apr. 4, 1970, 2016182

Int. Cl. B26f 1/00

U.S. Cl. 83—401 **14 Claims**



A punching apparatus for punching shapes out of sheet material by means of punching tools. A punching table made of bendable material is pressed toward the punching tools by a presser cylinder as the cylinder is moved in contact with and along one surface of the bendable punching tables while pressure is exerted against the opposite punching table surface by counter pressure means through said tools and through said sheet material to be punched.

3,813,979

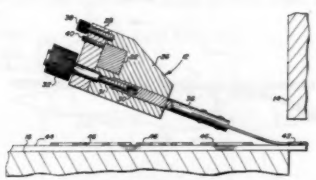
APPARATUS AND METHOD FOR GAUGING THE SHEAR OF CIRCUIT BOARDS TO SIZE

Dennis E. Rich, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 5, 1972, Ser. No. 241,291

Int. Cl. B26d 7/16

U.S. Cl. 83—467 **4 Claims**

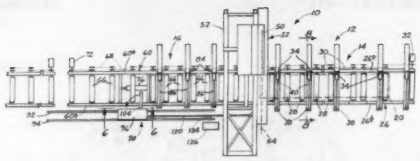


A spring finger guide locates a printed circuit board in a shearing assembly. The printed circuit board has shear targets embossed on the printed circuit board by the etching process. The printed circuit board is placed between the shear blades of a shearing apparatus with the shear target underneath the shear blade and held against the spring fingers. Actuation of the shear blades causes the board to be sheared to size at the shear targets.

3,813,980
TRIMMING APPARATUS

Douglas R. Rand; Richard D. Tinney, both of Molalla; Charles R. Woods, Oregon City, all of Oreg., and Edward M. Smith, Woodland, Maine, assignors to Publishers Paper Co., Oregon City, Oreg.

Filed Sept. 28, 1972, Ser. No. 292,851
Int. Cl. B27b *5/20, 27/04*
U.S. Cl. 83—467 **12 Claims**

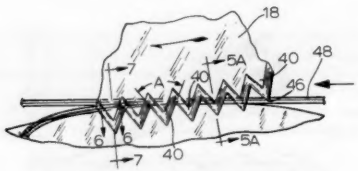


Lumber trimming apparatus including an elongated conveyor for carrying a bundle of lumber along a path with the bundle extending lengthwise of the path. A trimmer saw is movable across the path to trim ends of the bundle. An infeed conveyor section upstream in the path from the saw positions and holds the bundle for trimming of its lead end. An outfeed conveyor section downstream from the saw includes an elongated carriage extending longitudinally of the path and mounted for reciprocal movement along the path. Mounted on the carriage are support rollers which are driven under power to move a bundle rapidly along the path. The rollers are stopped when the bundle is approximately positioned for trimming of its trailing end. A ram connected to the carriage is operable to shift the carriage and a bundle thereon slowly and precisely to accurately position the trailing end of the bundle for trimming. An indicator carriage movable on a track parallel to the path includes an arm which is engaged by the leading end of the bundle and is carried thereby, with a tape measure indicating the distance from the leading end of the bundle to the saw. The arm is swingable out of the path of the bundle to allow the bundle to continue along the path after trimming.

3,813,981
PAPER TRIMMING KNIFE SYSTEM

Hans G. Faltin, York, Pa., assignor to Advance Enterprises, Inc., York, Pa.

Filed June 18, 1973, Ser. No. 370,600
Int. Cl. B26d *1/24*
U.S. Cl. 83—500 **5 Claims**

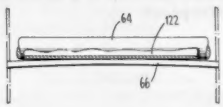


A rotary cutting knife for trimming signatures of multiple thicknesses of paper, such as folded press products, said knife having sharply pointed teeth around the periphery thereof, one surface of each tooth being planar, within the plane of one surface of said knife, and the edges of said teeth being beveled from the opposite surface at an acute angle to said one surface of said knife to provide camming surfaces on said teeth operable to engage a plurality of superimposed sheets of paper, including especially sheets folded upon themselves, and prevent the same from moving away from said planar surfaces of said teeth while shearing such paper by coaction of said teeth with a rotary bed knife having a planar face slidable in shearing relationship with said planar surfaces of said teeth on said cutting knife. During a rotary shearing operation, leading teeth of said cutting knife engage and progressively pierce the adjacent surfaces of said sheets of paper to maintain an intended line of cut accurately in alignment with the planar surface of said cutting knife and such penetrating movement into said paper continuing at least to the full depth of said teeth for shearing coaction with said rotary bed knife and thereby form a smoothly sheared accurate edge along one side of said paper.

3,813,982
KNIFE CUTTER

Helmut K. Waibel, San Leandro, Calif., assignor to The Singer Company, New York, N.Y.

Filed Mar. 19, 1973, Ser. No. 342,642
Int. Cl. B23d *17/00, 15/10*
U.S. Cl. 83—602 **4 Claims**

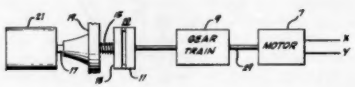


A knife cutter having a rotary rod-like knife and a flexible bowed stationary knife which is engaged and flexed upon rotation of the rotary knife to enhance the shearing effect for cutting record media, such as paper, spooled off a roll and to cause the knives to continuously sharpen themselves. The bowed and flexibility of the stationary knife has the additional advantage of making the positioning of the knives less critical which, together with means of easy removal of the knives from their cutting position facilitates maintenance thereof.

3,813,983
APPARATUS FOR ADJUSTING THE TENSION OF AN ELONGATED STRETCHED FILAMENT

Lawrence Gerald Paul, 821 Paularino St., Santa Ana, Calif.

Filed Nov. 20, 1972, Ser. No. 308,288
Int. Cl. G10g *7/00*
U.S. Cl. 84—458 **2 Claims**



There is disclosed apparatus for turning a rotatable pin for adjusting the tension of an elongated stretched filament attached to the pin or to a shaft which is geared or coupled to turn with the pin. A receiving receptacle engages the pin and is connected through a coupling mechanism to a converter for transforming energy to mechanical motion, whereby the mechanical motion is coupled to the receiving receptable to turn the pin and adjust the tension of the elongated stretched filament.

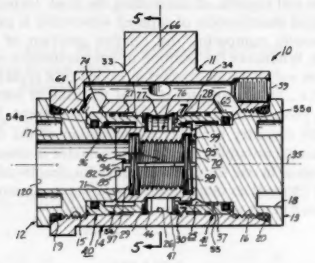
3,813,984
SEPARATION NUT

Eric P. Selinder, San Pedro, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed July 12, 1972, Ser. No. 270,949
Int. Cl. F16b *37/08*
U.S. Cl. 85—33 **23 Claims**

A separation nut wherein a segmented, internally threaded nut is releasable from a mating threaded male element, such as

a stud or bolt as a consequence of fluid pressure applied to the separation nut. The nut includes a plurality of nut segments which are grouped around a central axis of joinder, and which are held in position to receive the male threaded element by a pair of axially shiftable latch members which are movable in opposite directions relative to each other for unlatching the



segments and enabling them to be released from the threaded element. The latch members are actuated by substantially equal and opposite forces, whereby a minimum of unbalanced force is applied to surrounding structures by the separation forces. Optionally, a sequentially operating expulsion device may be provided in the separation nut to eject the threaded element after unlatching has taken place.

3,813,985

FASTENERS AND METHOD OF MANUFACTURE THEREOF

Garry R. Perkins, Carry, Ill., assignor to Spotnails, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 846,198, July 30, 1969, abandoned. This application Dec. 1, 1971, Ser. No. 203,610

Int. Cl. F16b *15/00*

U.S. Cl. 85—49 **12 Claims**

Improved fasteners providing superior bonding and holding power in wood or other materials. A variety of coated fasteners including single-bevel divergent point staples and an adhesive and coating composition to secure staples and other fasteners together in contiguous relation and to provide increased bonding holding power in the material into which the fastener is driven are disclosed.

3,813,986

SLEEV-LOK ANCHORS

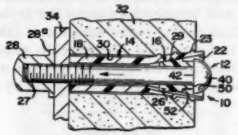
Harland E. McVittie, 1199 N.E. Cleveland St., Clearwater, Fla. 33515

Filed Mar. 3, 1972, Ser. No. 231,583

Int. Cl. F16b *13/06*

U.S. Cl. 85—75 **9 Claims**

A tubular expansion anchor comprising a resilient nylon sleeve including a centrally disposed annular channel expanding into a conically shaped opening at one end and an internally threaded conically shaped to seat within the conically shaped opening to expand the sleeve within an aperture formed in a supporting surface thereby securing the anchor in place whereby a bracket or like fixture is secured against a supporting surface by means of the anchor and a bolt or screw



extending through the fixture and into the anchor. Alternately, the screw or bolt may be reversed and a dome or decorative nut secured to the outer end thereof in either a blind or through hole.

3,813,987

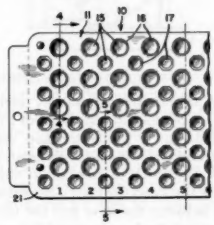
LOADING BLOCK

William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio

Filed May 10, 1972, Ser. No. 251,927

Int. Cl. F42b *5/30, 9/30*

U.S. Cl. 86—44 **10 Claims**



A loading block for ammunition cases has a plurality of variously sized chambers on both sides thereof for holding ammunition cases during filling. Each chamber has a shelf therein enabling it to accommodate at least two different case sizes.

3,813,988

GEAR HOBBING MACHINE

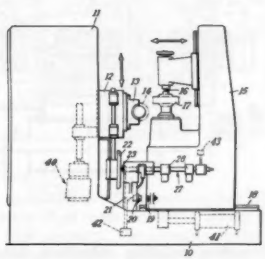
Brian Hodgson, Rowlands Gill, England, assignor to Machine Tool Divisional Services Limited, Coventry, Warwickshire, England

Filed Sept. 25, 1972, Ser. No. 291,595

Claims priority, application Great Britain, Sept. 27, 1971, 44932/71

Int. Cl. B23f *3/00, 5/22*

U.S. Cl. 90—2 **2 Claims**



A gear hobbing machine comprising a hob head, a table for supporting a workpiece to be hobbed, a template mounted on

one of said parts and arranged to traverse past a stylus during relative axial movement of the hob and workpiece to perform first and second cuts, means controlled by the stylus for effecting relative radial movement between the hob and the workpiece and thereby perform a crowning or taper hobbing operation on the workpiece, a push rod mounted on the part carrying the stylus and arranged to move the stylus into contact with the template during radial advance of said part towards the other part and means for automatically reducing the effective length of the push rod after the hob has made a first cut and prior to commencement of a second cut by the hob.

3,813,989

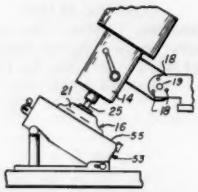
METHOD OF POSITIONING THE HEAD OF A MACHINE

John Janci, 1125 N. Karlov, Chicago, Ill. 60651

Filed June 14, 1973, Ser. No. 369,851

Int. Cl. B23b *1/12*

U.S. Cl. 90—11 R **4 Claims**



A method of positioning a generally vertically extending positionally adjustable tool-driving head of a machine, such as a milling machine, at a predetermined direction includes providing a base and fastening it to the head, positioning a flat smooth surface of the table normal to the predetermined direction, freeing the head for lateral movement, and causing relative motion between the base and the table until they engage one another and the base is seated flat against the surface of the table.

3,813,990

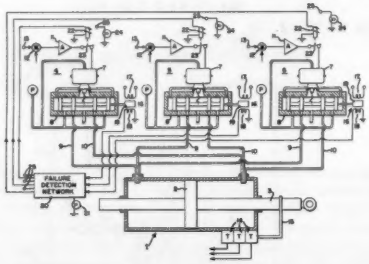
SERVO SYSTEM INCLUDING FLOW VOTING REDUNDANT FAILURE CORRECTING HYDRAULIC ACTUATOR

Patrick S. Coppola, Schenectady; Luther D. Sunderland, Apalachin, and Milton I. Wildrick, Endwell, all of N.Y., assignors to General Electric Company, Wilmington, Mass.

Filed Apr. 12, 1972, Ser. No. 243,322

Int. Cl. F01b *25/26;* **F15b** *9/03*

U.S. Cl. 91—1 **6 Claims**



A servo system including redundant, failure correcting hydraulic actuator is described which operates on the "flow voting" principle and contains circuitry for detecting and indicating failure in any of the servovalve channels which control the actuator. In a preferred embodiment of the invention, a plurality of servovalves, preferably three or more, control a single actuator cylinder. The servovalves are operated in parallel with identical input signals. In normal operation each servovalve allows an equal amount of fluid to flow to the actuator cylinder. In the event of a failure of any servovalve (or any component of the associated servo loop), the remaining servovalves, automatically compensate the flow so that the actuator is still capable of controlling the load. Detection, indication and deactivation of a failed servovalve is provided by continuously comparing the relative position of each servovalve. Whenever the position of one servovalve varies from the other valves by an amount in excess of a preset threshold value (i.e., an amount in excess of that due to normal variations in valve tolerances) a malfunction is present. The failure detection circuitry provides an indication of the failure and the channel containing the failed servovalve is simultaneously deactivated. In one form, the circuitry for deactivating the servovalve channel so that the actuator output remains basically unaffected in the event of a second failure.

3,813,991

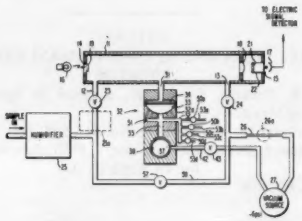
EXPANSION APPARATUS FOR CONDENSATION NUCLEI MONITOR

Theodore A. Rich, Scotia, N.Y., assignor to Environment/ One Corporation, Schenectady, N.Y.

Filed Mar. 9, 1971, Ser. No. 122,460

Int. Cl. F15b *21/02, 13/04*

U.S. Cl. 91—31 **2 Claims**



A variable rate continuous flow condensation nuclei meter is an apparatus which includes an expansion chamber having inlet and outlet passageways for introducing into and withdrawing from the expansion chamber specimens of a sample gaseous atmosphere to be monitored for condensation nuclei. Inlet and outlet cutoff valves are disposed in the inlet and outlet passageway for allowing a specimen of a sample gaseous atmosphere being monitored to be drawn from an intake probe or other sample atmosphere intake arrangement through the inlet passageway and expansion chamber, out the outlet passageway and to a source of low pressure provided by a suitable evacuating apparatus. With the valves open, differential flow of a sample gaseous atmosphere takes place from the intake probe through the expansion chamber into the evacuated space. During each operating cycle the inlet and outlet valves are closed simultaneously for at least a short time duration sample interval to trap a specimen of the atmosphere being tested in the expansion chamber during the sample interval. At this point, the interior of the expansion chamber is suddenly decreased in pressure so as to form small liquid droplets around the condensation nuclei contained in the gaseous atmosphere as centers. A radiant energy irradiating and detecting device is positioned to view the interior of the expansion chamber and is operative during the sample interval to derive an output electric signal representative of the intensity of the radiant energy attenuated or scattered by the small liquid droplets thus formed on the condensation nuclei as centers. The output electric signal thus derived comprises a measure of the number of condensation nuclei contained in the specimen of the gaseous atmosphere being tested during each

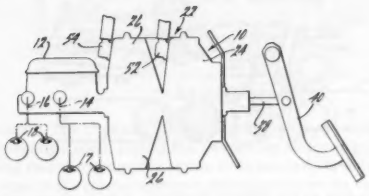
sample interval. Following measurement the interior of the expansion chamber is recompressed to a pressure corresponding to its pre-expansion value. The present invention describes an improved expansion apparatus for accomplishing the above described sequence of events with a simple and relatively inexpensive mechanism and which maintains the vacuum-tight integrity of the expansion chamber to thereby provide a reliable and accurate reading of the condensation nuclei particles present in an atmosphere being monitored.

3,813,992

DUAL FLUID PRESSURE MOTOR

Curtis Leroy Brown, West Dundee, Ill.

Filed Mar. 29, 1972, Ser. No. 239,165
Int. Cl. F15b 9/10; F01b 19/00
U.S. Cl. 91—189 **12 Claims**



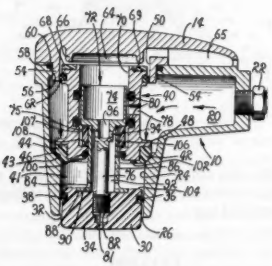
A fluid pressure motor power brake mechanism employing two power systems each under the control of separate valve means to apply the resultant power force of both power brake systems to a hydraulic system for actuating the brakes at the wheels of a vehicle in such a manner that disabling of one or the other of the power brake systems leaves the remaining power brake system to apply power braking force to the hydraulic braking system associated with the wheels of a vehicle.

3,813,993

IMPACT TOOL

Arthur J. Smith, P.O. Box 3274, Visalia, Calif. 93277

Continuation of Ser. No. 46,427, July 2, 1970, abandoned.
This application Nov. 24, 1972, Ser. No. 308,948
Int. Cl. F01b 25/04
U.S. Cl. 91—220 **12 Claims**



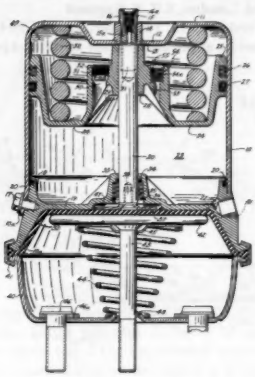
A pneumatically driven impact tool particularly suited for use in delivering impacting blows to a working surface, characterized by an hermetically sealed housing including therein an impact head and a plurality of interrelated valves adapted to be coupled with a source of pressurized fluid for imparting reciprocating displacement to the impact head. A particular feature of the tool includes a simplified pilot valve operatively coupled with the impact head in a manner such that a cycle of operation of the impact tool is initiated as the impact head forcibly is positioned against a working surface.

3,813,994

INTERNAL AIR ASSISTED BRAKE ACTUATOR

Kenneth D. Swander, Jr., Prairie Village, and Ronald D. Wilkins, Overland Park, both of Kans., assignors to Certain-Teed Products Corporation, Valley Forge, Pa.

Division of Ser. No. 148,921, June 1, 1971. This application Apr. 10, 1972, Ser. No. 242,592
Int. Cl. F15b 13/042, 15/17
U.S. Cl. 91—471 **4 Claims**



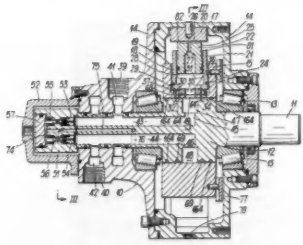
A spring emergency and parking brake which is further air-assisted for added force in the application of the spring emergency brake; that is, there is a combination of air and spring pressure utilized to apply the brakes in an emergency situation when the primary or service air source, normally employed in operating the brakes, fails in one way or another. The source of the air-assisting force is internal to the brake actuator housing and derives from the air used to compress the emergency spring.

3,813,995

FLUID PRESSURE MACHINES

Robin Bruce Harris, Brentwood, England, assignor to Hydrostatic Transmission Limited, England

Filed June 18, 1973, Ser. No. 370,846
Claims priority, application Great Britain, June 20, 1972, 28765/72
Int. Cl. F01b 13/06
U.S. Cl. 91—488 **8 Claims**



In a radial, multi cylinder fluid pressure machine, adverse mechanical and/or fluid loads occurring during running are minimised by fluid pressure. The capacity of the machine is selectable by provision of a plunger sleeve and an inner plunger in each cylinder bore, and by valve means selectively controlling their operation so that they can work concurrently

or the inner plunger works alone. The adverse loads are minimised by appropriate fluid pressure exerted at opposite ends of the working plungers.

3,813,996

CONTINUOUS FILTER ROD MAKING MACHINES

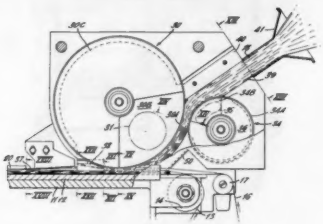
Francis A. M. Labbe, 63, Rue de Chezy, 92 Neuilly-Sur-Seine, France; Edward G. Preston, 2, Evelyn St., Deptford, London, S.E. 8, England; Brian Hodsall, 2, Evelyn St., Deptford, London, S.E. 8, England, and Clifford R. Marritt, 2, Evelyn St., Deptford, London, S.E. 8, England

Filed Apr. 14, 1972, Ser. No. 243,964

Claims priority, application Great Britain, Apr. 15, 1971, 9482/71

Int. Cl. A24c *5/50*

U.S. Cl. 93—1 C **15 Claims**



A continuous cigarette filter rod making machine in which a tow or web of crimped filaments is fed on to a continuous paper web and is wrapped to form a filter rod. In one construction a compression wheel is provided between upstream and downstream parts of a tongue. In a second construction the upstream part of the tongue is replaced by a channel cooperating with the wheel. In a third construction the tow passes between two suction wheels, and in the fourth construction the compression means is a suction band passing around two wheels upstream of the tongue.

3,813,997

DEVICE FOR MAKING CIGARETTE PACKAGE WRAPPINGS

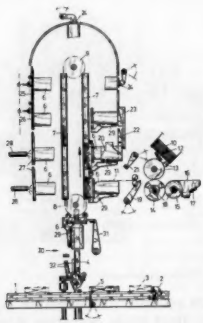
Otto Niepmann, Gevelsberg, Germany, assignor to Maschinenfabrik Fr. Niepmann & Co., Gevelsberg, Germany

Filed Apr. 23, 1973, Ser. No. 353,585

Claims priority, application Germany, Apr. 21, 1972, 2219540

Int. Cl. B31b *1/30, 1/62, 1/64*

U.S. Cl. 93—12 C **2 Claims**



A device for making cigarette package wrappings on cigarette packaging machines, in which paper cuts are successively withdrawn from a stack of cuts and are by heated transmission rollers which have picked up an adhesive from a heated adhesive containing storage container provided at selected areas with adhesive and are subsequently by a folding device folded to form a package wrapping for receiving a block of cigarettes. At the end of the folding operation the folded parts to be connected to each other are by a heated strip pressed against each other and subsequently cooled.

3,813,998

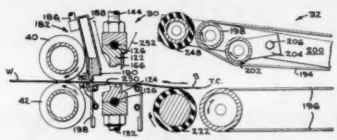
APPARATUS FOR MAKING BOTTOM SEAL THERMOPLASTIC BAGS

Ronald L. Lotto, Bonduel, Wis., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 198,282, Nov. 12, 1971. This application Mar. 26, 1973, Ser. No. 344,691

Int. Cl. B31b *1/16, 1/64*

U.S. Cl. 93—33 H **5 Claims**



According to the present disclosure, tubular thermoplastic material is intermittently fed between opposed transversely extending seal bars operating in timed relation with the intermittent feeding of the web to sequentially perform cutting and sealing of the web during its period of repose. While the sealed portion of the web is at the sealing station, cooling air is discharged along the sealed portion of the web to effect cooling.

3,813,999

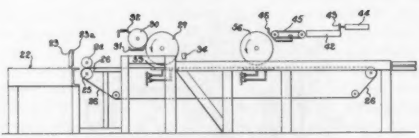
APPARATUS FOR COMBINING PARTITION AND BOX BLANK

William H. Friend, Martinsville, N.J.; Stuart L. Natof, Lovettsville, Va.; Eugene A. Reiter, Morrisville, and David W. Eudman, Doylestown, both of Pa., assignors to Union Camp Corporation, Wayne, N.Y.

Filed Oct. 2, 1972, Ser. No. 293,941

Int. Cl. B31b *11/02*

U.S. Cl. 93—37 R **11 Claims**



The assembly of a collapsible cellular partition with a box blank to form a combination partition box in collapsed condition for shipping and use.

3,814,000

APPARATUS FOR AUTOMATICALLY FEEDING AND ERECTING FOLDED CARTONS

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07407

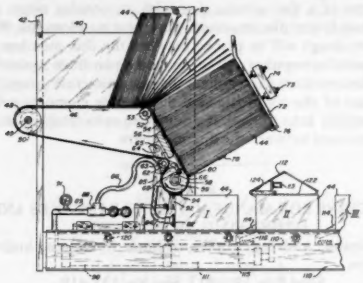
Division of Ser. No. 204,892, Dec. 6, 1971, Pat. No. 3,740,919. This application Feb. 27, 1973, Ser. No. 336,246

Int. Cl. B31b *1/76*

U.S. Cl. 93—53 SD **5 Claims**

An apparatus and method is disclosed for receiving folded cartons in a vertical manner in a storage chute and to deliver and retain these cartons in a substantially horizontal delivery

chute. The cartons are withdrawn one-at-a-time from this horizontal chute by an arm means on which a plurality of suction cups are mounted. By swinging this arm the vacuum cups are brought into engagement with the lowermost carton whereat vacuum is applied to the cups to cause attachment to



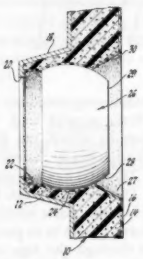
the carton. The cups and attached carton are then swung to a transporting station. During this swing, cam means engage the moving carton to cause the carton to be erected. At the transport station the erected carton is disengaged from the vacuum cups and then moved to loading operations.

3,814,001

AIR VENT IN VEHICLE COMPARTMENT PANEL

Robert T. Hill, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 18, 1972, Ser. No. 272,986
Int. Cl. B60h *1/24*; **F24f** *13/06*
U.S. Cl. 98—2 **1 Claim**



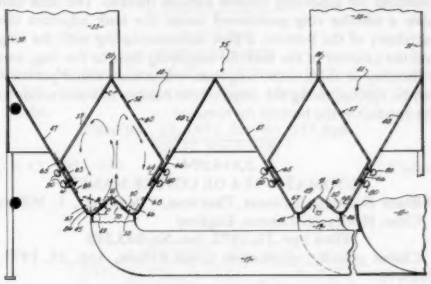
A vehicle passenger compartment air vent arrangement wherein an air vent nozzle is frictionally retained within an elastomeric foam padded trim or instrument panel. The elastomeric foam is molded on the panel and is covered with a layer of thermal setting plastic material. The padded panel is molded containing a pre-sized socket for receiving an air vent nozzle assembly. The air vent nozzle and the socket have comparative dimensions such that the nozzle can be inserted through an expansible throat area of the socket and be rotated therein for directing the flow of air into the vehicle passenger compartment. The air vent nozzle is retained in the socket by frictional forces of the foam and its cover as their elastomeric qualities require them to contact in an attempt to return to their original unexpanded molded positions. The retaining frictional force provided by the elastomeric qualities of these materials is sufficiently low to allow an occupant of the vehicle to manually position the nozzle while being sufficiently high to retain the nozzle in any adjusted position. Since the thermal setting plastic cover is molded over the entire socket area, no finishing moldings are required.

3,814,002

POWDER SPRAY BOOTH

Frank Rombach, Kraainem, and Cornelis N. Venlet, Brussels, both of Belgium, assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 26, 1973, Ser. No. 354,848
Int. Cl. B05b *5/08, 15/02*
U.S. Cl. 98—115 SB **36 Claims**



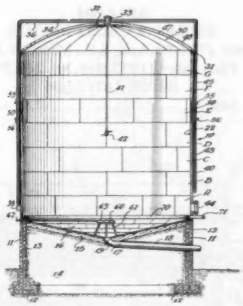
An electrostatic powder spray booth for facilitating the cleaning of the booth and the recovery of powder spray material. The booth has a bottom divided into troughs, each one of which is individually connected to a powder recovery system through a suction hose and manifold connection. Within each trough there is a baffle plate configurated so as to create a high velocity air stream along the side walls of the trough and an air turbulence chamber beneath the plate so that powder is swept from the side and bottom walls of the trough and out of the turbulence chamber into the powder recovery system. The baffle plates are adjustably mounted within the bottom troughs so that the velocity of the air stream over the side walls of the trough may be controlled and varied and the ports which connect the trough to the recovery system are adjustable in size so that the system may be balanced to maximize the cleansing effect of the suction air streams.

3,814,003

BREWING APPARATUS

Nickolas Lothar Vacano, Seattle, Wash., assignor to The Rainier Companies, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 82,404, Oct. 20, 1970. This application Nov. 20, 1972, Ser. No. 308,135
Int. Cl. C12b *1/10*
U.S. Cl. 99—276 **11 Claims**



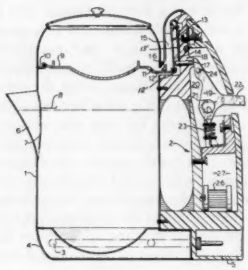
A large size thin-shelled outdoor metal tank, such as for making beer, with a conical metal bottom having a shallow slope of no more than 25° from the horizontal, a conduit com-

municating with the tank interior at the apex of the conical bottom, a circular cylindrical vertical metal wall joined to the bottom, a metal roof joined to and supported by the vertical wall, insulation exterior of the bottom, wall and roof, a vent opening in the roof, a manifold centrally located in the tank spaced above the bottom and the level of unsuspended solids which may settle therein, said manifold having a plurality of openings through which carbon dioxide gas can exit into liquid in the tank, and a pipe leading from outside the tank to the manifold for supplying carbon dioxide thereto. The tank can have a tubular ring positioned inside the tank adjacent the periphery of the bottom, a pipe communicating with the ring and the exterior of the tank for supplying fluid to the ring, and a plurality of holes in the ring from which fluid under pressure can be ejected along the slope of the bottom to wash solids to the conduit in the bottom for removal.

3,814,004
AUTOMATIC TEA OR COFFEE MAKER

William Hermann Brenner Thornton, "Derwent", 1, Milton Close, Henley-on-Thames, England

Filed Apr. 12, 1972, Ser. No. 243,292
Claims priority, application Great Britain, Apr. 15, 1971, 9489/71
Int. Cl. A47j *31/00*
U.S. Cl. 99—283 **6 Claims**

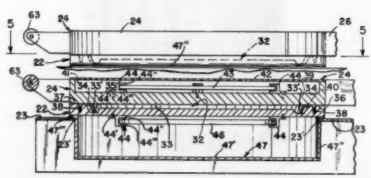


An automatic tea or coffee maker includes a bi-metallic strip or equivalent means mounted where it can be contacted by steam generated in an electrically heated container. When the bi-metallic strip flexes on heating it releases a support holding tea leaves or coffee grounds above the water in the container. The tea leaves or coffee grounds are thus deposited in the water.

3,814,005
PIZZA PIE CRUST DEVICE

John E. Widdel, 1704 4th Ave., S.E., Minot, N. Dak. 58701

Filed July 6, 1972, Ser. No. 269,326
Int. Cl. A47j *37/06*
U.S. Cl. 99—349 **1 Claim**

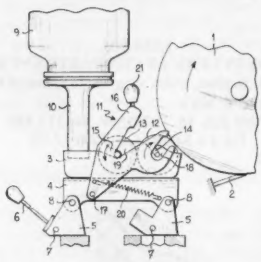


The invention comprises a pizza pie crust making device for making pizza pie crusts. The device has a housing and an upper and lower disc member. The lower disc member is fixed to the housing. The upper disc member has a flat lower surface and is pivotally mounted to the housing to pivot down flush upon the lower disc member. The lower disc member has an annular central recessed portion with an annular groove about the outer edge, which when the upper disc member is pivoted down flush against the lower disc member will form the hollow silhouette of a flat annular disc with an annular ridge. The upper and lower disc members have heating elements. Pizza pie crust dough will be placed between the disc member and the upper disc member will be pivoted down flush against the lower disc member to compress the pissa pie crust dough into the shape of the silhouette and the heating elements will at least partially bake or cook the dough, so as to retain its shape, as compressed between the disc members.

3,814,006
MACHINE FOR MANUFACTURING PANCAKES AND OTHER SIMILAR PRODUCTS

Abel Giraud, Andresy, France, assignor to Gideco, Andresy, France

Filed Feb. 12, 1973, Ser. No. 331,419
Claims priority, application France, Feb. 24, 1972, 72.06262
Int. Cl. A21b *1/48*; A47j *37/10*
U.S. Cl. 99—423 **15 Claims**



A machine for manufacturing pancakes and the like from a liquid paste having first, second and third substantially horizontal driven rollers in which the first has the larger diameter and is located adjacent to the second which is in nip relation with the third. The first has a smooth surface and is a heated cooking roller. The other two are rotated in opposite directions and have their lower parts immersed in a trough of paste. The third roller has a recess in its periphery to shape the liquid paste, permitted through the nip, on the smooth surfaced second roller so that the paste has a shape which when transferred from an upper surface of the second or transfer roller to the cooking roller gives the pancake its desired shape thereon.

3,814,007
INJECTING APPARATUS

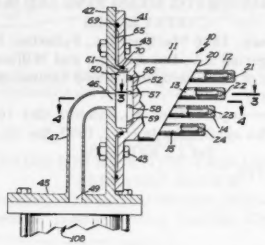
Donovan H. Lumby, Brooklyn Center; James T. Buerman, New Brighton, and James P. Korzenowski, Minneapolis, all of Minn., assignors to Land O'Lake Inc., Minneapolis, Minn.

Filed June 1, 1972, Ser. No. 258,768
Int. Cl. A22c *9/00*; A23b *1/16*; A47j *43/16*
U.S. Cl. 99—532 **11 Claims**

An injector head for use in apparatus for injecting the fluid into an object in which there are one or more nozzle passages projecting outwardly with terminal portions adapted to engage the object being injected and in which there is valve means for preventing flow of fluid through the nozzle passage until the pressure of the fluid within the nozzle passage reaches a predetermined value at which time the valve means opens abruptly so as to cause a sudden release of the fluid. The injec-

tor head preferably has a plurality of nozzles and there is a valve in each nozzle. The valves preferably have their valving surfaces closely adjacent the terminal portions of the nozzle passages so that the change in pressure due to the opening of the valve is immediately transmitted to the fluid entering the object. The injector head is specifically designed for injection of an irregular object such as a turkey and the terminal portions of the nozzle passages are spaced varying distances from a vertical plane to conform with the surface of the object to be injected.

The injector head is provided with a passage for circulation of injecting fluid so that where the injecting fluid is maintained at a temperature above the ambient temperature, this insures that the injector head will be maintained at a temperature



close to the desired temperature for injecting the fluid and will not cause cooling of the injecting fluid at the time of injection. In one form of the invention, an annular passage is provided for circulating such fluid. In another form, the fluid is circulated through certain of the nozzle passages until such time as the pressure is increased to injecting pressure; at this time, the flow of circulating fluid is interrupted.

In the case of an injector head for injecting a turkey, there are two rows of nozzle passages which diverge outwardly and downwardly, the nozzles projecting outwardly from a vertical plane progressively shorter distances proceeding from top to bottom. With this arrangement, the terminal portions of the nozzles fit closely against the opposite sides of the breast of a turkey or similar fowl.

3,814,008

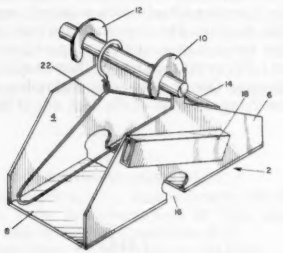
HAMPER FOR GARMENT HANGERS

Wadea G. Beshara, 3820 S. Glory Pl., Tulsa, Okla. 74108

Filed July 5, 1972, Ser. No. 269,127

Int. Cl. B65b *17/02*

U.S. Cl. 100—1 **5 Claims**



This invention concerns a hamper for twisted wire or equivalent garment hangers. The hamper comprises two opposed side walls separated by a base portion running the length of the side walls. A slot about midway of the ends of the two walls and at the bottom thereof extends across the base portion and part way up each of the walls. When the hamper is full of hangers, a wire can be inserted through the slot, looped around the hangers and tied to form the hangers into a secure bundle. A hook extends from the top edge of each wall so that the hamper can be hung from a suitable support.

The present invention relates to a device for handling clothes hangers. More particularly, it is concerned with an improved hamper in which unused clothes hangers—twisted wire, plastic or wooden—can be compactly arranged and prevented from becoming tangled with one another and with garments hung on the same rod in a closet.

3,814,009

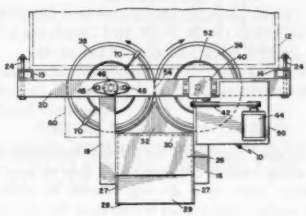
CAN CRUSHER

Charles M. Davis, Jr., Bonita, and Joseph N. Fox, Coronado, both of Calif., assignors to Scrap Metals Inc., San Diego, Calif.

Filed Dec. 22, 1972, Ser. No. 317,808

Int. Cl. B30b *3/00*

U.S. Cl. 100—159 **11 Claims**



A can crusher using a pair of wheels with resilient tires that are arranged for in-line rotational movement with the tires touching. Cans are directed by a chute into the intersecting contacting area of the rotating tires, whereby the cans are crushed in passing therebetween with the speed of rotation of the tires projecting the cans with considerable force, causing the cans to move to deposit at the other end of a large container.

3,814,010

MECHANISM FOR DOUBLE PRINTING WITH A POSSIBILITY FOR BARRING SECOND PRINTING

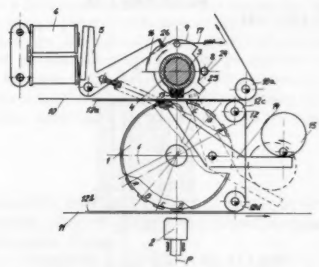
Ivan Tenev Stanchev; Anton Dimitrov Popov, and Ivan Varbanov Varbanov, all of Sofia, Bulgaria, assignors to Dso Izot, Sofia, Bulgaria

Filed May 1, 1972, Ser. No. 249,104

Claims priority, application Bulgaria, Apr. 29, 1971, 16446

Int. Cl. B41l *19/02*

U.S. Cl. 101—90 **6 Claims**



A double-printing mechanism wherein a hammer drives a ribbon against a paper sheet on one side of a print wheel which is diametrically shiftable to bear against another ribbon and paper. The print wheel has a resiliently deflectable rim and means for shifting an anvil out of the way to exclude second printing.

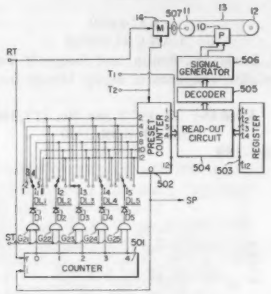
3,814,011
SYSTEM FOR ADVANCING A WRITING HEAD FOR PRINTER

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 11,486, Feb. 16, 1970. This application Apr. 24, 1972, Ser. No. 247,215

Int. Cl. B41j *27/00*

U.S. Cl. 101—93 C **6 Claims**



For recording characters on a fixed recording medium, a printer writing head is advanced on a step by step basis by a pulse motor used as a driving means. A writing means mounted on the writing head is energized for recording when the writing head is at rest. Alternatively, the writing means on the writing head is energized for recording when the writing head is advanced by the pulse motor. Further, recording of the characters is made in recording fields or columns in accordance with a predetermined tabulation form, which can be changed, during either of the energized and deenergized periods of the pulse motor. In case that recording is performed in accordance with the established tabulation form when the writing head is advanced, a flywheel is preferably associated with a power transmission mechanism such as a shaft disposed between the pulse motor and the writing head to render the flywheel effect to the movement of the writing head to facilitate the tabulating function.

3,814,012
TRAIN PRINTERS

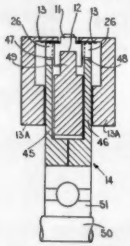
Roman Derc, Letchworth, England, assignor to International Computers Limited, London, England

Filed July 20, 1972, Ser. No. 273,594

Claims priority, application Great Britain, July 23, 1971, 34605/71

Int. Cl. B41j *1/16*

U.S. Cl. 101—111 **5 Claims**



A train printer cartridge and print slug arrangement having a closed loop guide track for non inter connected print slugs freely slidable in the guide track and each having a single drive tooth on each side of the slug, the teeth meshing with notched drive wheels. The track arrangement permits the slugs to move from abutting contact whilst meshing with the wheels and also enables transformation of angular motion around the wheels to the straight line motion for advancing to the printing section to be completed before the slug leaves the drive wheels.

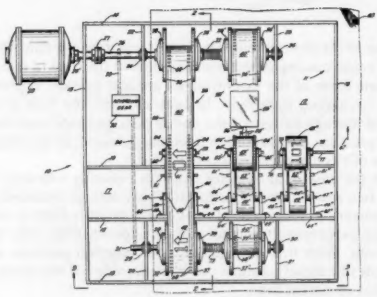
3,814,013
STENCIL PRINTER FOR MEASURING AND MARKING CARPET ROLLS

Martin L. Strauss, 1800 Mariposa Ln., Fullerton; Philip Borsuk, 624 Tigertail Rd., Los Angeles, and William Alvarez, Placentia, all of Calif., assignors to said Strauss and Borsuk, by said Alvarez

Continuation-in-part of Ser. No. 866,805, Oct. 16, 1969, abandoned. This application June 12, 1972, Ser. No. 262,027

Int. Cl. B41l *13/08*

U.S. Cl. 101—121 **9 Claims**



An apparatus for measuring and marking, in numbered linear units, the length of a roll of carpet or other material which has a face and a back side. The apparatus periodically prints, on the back side of the material, a linear unit which is indicative of the length of the material from the beginning of the roll. The apparatus includes an elongated tape which is driven by a sensing wheel which positively engages the back side of the material. The elongated tape operates as a stencil, having the linear units positioned at spaced intervals thereon. An inked roller prints the units on the material under the control of the tape. One or more additional rollers may be used to print identifying markings on the back side of the material.

3,814,014
INKER

Harold P. Dahlgren, 726 Regal Row, Dallas, Tex. 75247

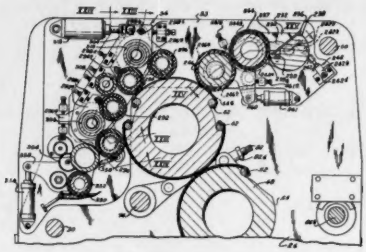
Continuation-in-part of Ser. No. 737,521, June 17, 1968, Pat. No. 3,664,261. This application May 4, 1972, Ser. No. 250,449

Int. Cl. B41f *31/06*

U.S. Cl. 101—137 **14 Claims**

An inker for applying ink to a printing plate comprising a primary inker arranged to apply ink to a storage pad on the

plate cylinder in combination with a secondary inker arranged to transfer ink from the storage pad to the printing plate. The

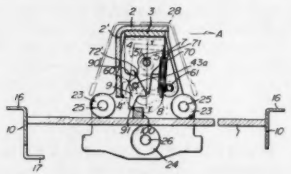


storage pad is raised such that the primary inker engages same without contacting the printing plate.

3,814,015
PRINTING MACHINE WITH A ROLLER PLATEN RELEASING DEVICE

Yoshiaki Ozaki, and Fumiyuki Mishima, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1972, Ser. No. 230,903
Claims priority, application Japan, Feb. 24, 1971, 46-11211
Int. Cl. B41f *3/04*
U.S. Cl. 101—269 **9 Claims**



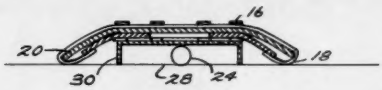
A carriage supporting a roller platen frame is manually moved in a printing stroke and in a return stroke over type wheels on a printing bed. A releasing lever, resiliently connected with the roller platen frame, shifts the same between a printing position and an inoperative position when engaged and displaced by fixed actuating blocks during the carriage movements. A biased holding lever arrests the roller platen frame in either position. The resilient connection between the releasing lever and the roller platen frame, preferably including abutting slide faces, permits movement of the yielding releasing lever over the actuating blocks after the frame has been placed in the printing position or the inoperative position.

3,814,016
BOMB SUPPRESSION DEVICE

Jack Leach, Greensboro, N.C.; Jerome Zoufaly, Westfield, and William G. Fash, Jamesburg, both of N.J., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 22, 1973, Ser. No. 343,654
Int. Cl. F42d *5/04*
U.S. Cl. 102—22 **6 Claims**

A bomb suppression device for use in shielding an explosion of a small explosive device such as a pipe bomb. The suppression device has upper and lower blankets held together by flexible straps. The flaps attached to the upper blanket extend down towards the lower blanket when the device is in an expanded position. The bottom blanket has a central opening which acts as a flue for the gases released by the bomb, directing the gases upwardly and causing the device to expand in a balloon-like manner. The straps attaching the upper blanket to the bottom blanket are long enough to provide a gap

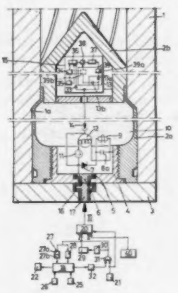


between the lower edge of the flaps and the edges of the bottom blanket to allow the escape of gases generated by an explosion. A standoff device is utilized which is first placed over the bomb so that the blanket members may be positioned without making contact with the bomb.

3,814,017
METHOD AND SYSTEM ARRANGEMENT FOR DETERMINING THE TYPE AND CONDITION OF AMMUNITION READY FOR FIRING

Gunter Backstein, Meerbusch, and Frank-Volker Spath, Dusseldorf, both of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Dec. 6, 1971, Ser. No. 205,102
Claims priority, application Germany, Dec. 4, 1970, 2059665
Int. Cl. F42b *9/08;* **F42c** *11/00, 11/06*
U.S. Cl. 102—70.2 R **27 Claims**



Method and system arrangement for determining the type and condition of ammunition which is ready for firing and can be detonated electrically wherein specific signals corresponding to the type and the condition values are sent as correction signals to a firing control computer processing the target data for positioning a piece of ordnance and/or for setting a fuse of the ammunition. The ammunition is electrically detonated by means of an electric propellant charge ignitor connected between the case of the ammunition and a centrally disposed contact insulated from the case with all measuring and control signals being supplied to the ammunition via the central contact.

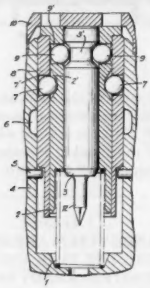
3,814,018
SAFETY DEVICE FOR PERCUSSION FUSE

Andre Francis Albert Daniel, Bourges, France, assignor to Etat Francais, Paris, France

Filed Feb. 1, 1971, Ser. No. 111,658
Claims priority, application France, Apr. 22, 1970, 70.14529
Int. Cl. F42c *15/04*
U.S. Cl. 102—78 **7 Claims**

A safety device is provided which can slide in axial direction inside a seating of a fuse, wherein it can be locked in an extreme position toward the back of the fuse before missile

discharge. The device has a primary part which is initially locked in a position to the front of the fuse and a second part which can slide relative to the first one. An interlock is provided between the primary and second parts and provision is made for disengaging these parts when the primary part is frontward in the fuse. A third part is provided which is capable

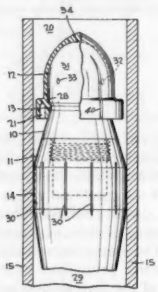


of sliding relative to the second part. An interlock couples the second and third parts but provides for disengaging them after the second part has been disengaged from the primary part. A percussion device associated with the third part effects the operation of the fuse during the frontward movement of the third part after disengagement thereof from the second part.

3,814,019
EXPANSILE PROTECTIVE CAP FOR FLUIDIC ORDNANCE FUZES

Harold L. Hines, Jr., Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 26, 1972, Ser. No. 275,372
Int. Cl. F42b *13/18*
U.S. Cl. 102—91 **7 Claims**

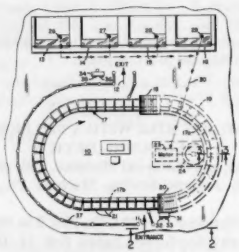


An expansile protective cap designed to cover the intake and exhaust ports of an air driven power generator used in an electronic fuze. The cap is constructed of rubber or a rubber-like plastic that remains flexible over extreme temperature ranges and extended times of military interest. This expansile protective cap prevents the entrance of foreign matter into the ports and operating cavity of the generator and impeller before the projectile is fired from a gun. The protective cap is manually removable. However, this is not required. The cap has been designed and features have been incorporated therein such that the cap is automatically removed upon firing. The protective cap comprises a number of blind, oblong cavities located around its circumference. These cavities trap escaping propellant gas and force the skirt of the cap to expand outward. This expansion stretches the cap beyond a lip on the midbody of the fuze and blows it up somewhat like a balloon. Propellant gas escaping toward the end of the barrel of the gun upon entrapment by the cap automatically remove it. This entrapment action usually causes the cap to burst. The cap is scored to enhance the bursting action.

3,814,020
SERVICE WINDOW CONTROLLED SEAT CONVEYOR SYSTEM

Louise Oliver, 538 W. 79th St., Los Angeles, Calif. 90044

Filed July 9, 1973, Ser. No. 377,571
Int. Cl. B62d *55/00*
U.S. Cl. 104—25 **3 Claims**

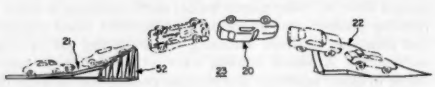


A seat conveyor system is incorporated in a large room for moving persons over the floor area from a designated entrance area to a plurality of service windows in the room. The arrangement is such that individual persons entering the entrance area can be seated while waiting in line for service at any one of the service windows.

3,814,021
SPIRAL JUMP STUNT APPARATUS

Raymond R. McHenry, Williamsville, N.Y., assignor to Calspon Corporation, Buffalo, N.Y.

Filed Nov. 13, 1972, Ser. No. 306,240
Int. Cl. A63g *1/00*
U.S. Cl. 104—69 **15 Claims**



Spiral jump stunt apparatus, either in full scale version or toy version, in which a wheeled vehicle takes off from a ramp so constructed as to impart roll, pitch and lift impulses to the vehicle as it assumes free flight to cause the vehicle to spiral while jumping a gap between such take-off ramp and a receiving ramp on which the vehicle lands on its wheels.

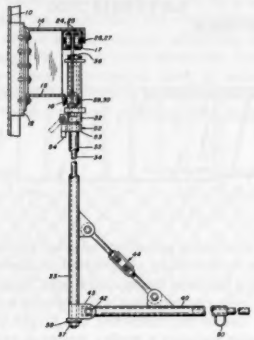
3,814,022
TROLLEY APPARATUS FOR PREVENTING OR ARRESTING THE FALL OF AN INDIVIDUAL

Joe H. Smith, Bluff Park, Ala., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 12, 1972, Ser. No. 252,762
Int. Cl. B61b *5/02*
U.S. Cl. 104—89 **3 Claims**

Trolley apparatus for preventing or arresting the fall of an individual is horizontally movable along a track which is

mounted to one side of a pathway. A handle extends over the pathway to which handle the individual ties his safety line, and



by which he grasps the apparatus and propels it along the pathway.

3,814,023

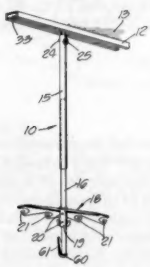
VERTICALLY ADJUSTABLE SUSPENSION ASSEMBLY

Thomas D. Stantial, Long Beach, Calif., assignor to The New Standard Company, Inc., Dana Point, Calif.

Filed June 19, 1973, Ser. No. 371,377

Int. Cl. B61b *3/00*

U.S. Cl. 104—94 **18 Claims**



A vertically adjustable suspension assembly of general utility preferably supported on a trolley operating in an overhead track. The assembly includes loose fitting, telescopic tubes the lower one of which supports a clutch plate having a sharp edge projecting through the tube wall and biased into locking engagement with the interior surface of the upper tube to lock the assembly in any selected adjusted position. Operating means at the lower end of the assembly functions to release the clutch and to adjust the tubes to a desired new position. Release of the handle automatically locks the assembly against extension. The assembly is of general utility as, for example in hospitals and sick rooms to support numerous sick room items.

3,814,024

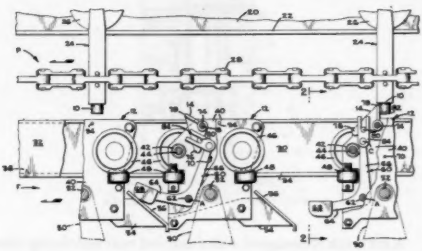
PUSHER PAWL MECHANISM FOR POWER AND FREE CONVEYOR SYSTEM

Alfred O. Peter, Hatboro, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed July 28, 1972, Ser. No. 276,188

Int. Cl. B65g *17/42*

U.S. Cl. 104—172 S **4 Claims**



A power and free conveyor system has trolleys which are mounted on a free track for driving when engaged by pushers on a continuously running power chain. On each trolley, a pusher pawl, lost motion link, and bellcrank lever are interconnected to hold the pusher pawl erect for engagement by a pusher when the lever is in a normal position. When the lever is pivoted by engagement with a preceding trolley, the pusher pawl can collapse. The lost motion link also permits collapse of the pusher pawl on overtaking a pusher.

3,814,025

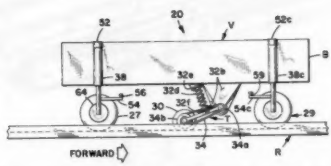
TRANSPORTATION SYSTEM

Roy A. Nelson, Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed June 1, 1972, Ser. No. 258,701

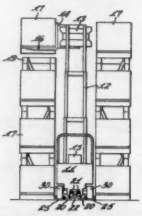
Int. Cl. B62d *11/04*

U.S. Cl. 104—242 **6 Claims**



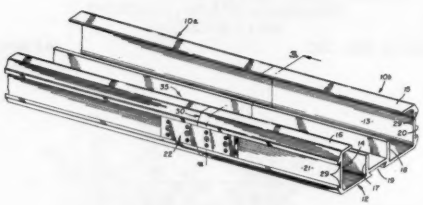
A transportation system including a roadway having a pair of elongated parallel tracks whose shape in cross-section is domed or convex and a pair of guide flanges positioned outwardly of the tracks, and a vehicle having wheels provided with resiient track-engaging means, such as pneumatic tires, and driving means for propelling the vehicle over the roadway. The wheels of the vehicle tend to follow the tracks because of the deformation of the tires if they tend to move laterally off the center portions of the tracks, and the guide flanges engage the tires, upon the wheels having moved off the tracks because of the imposition of excessive side loads on the vehicle, to turn the wheels back onto the tracks.

3,814,026
STABILIZING APPARATUS FOR LIFT TRUCKS
Joseph H. Maloney, Olympia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Feb. 2, 1973, Ser. No. 329,127
Int. Cl. B61f *9/00*
U.S. Cl. 104—246 **6 Claims**



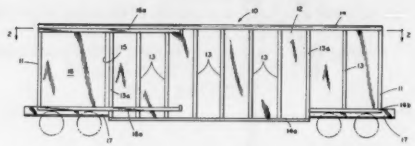
A lift truck is equipped with front and rear stabilizing rollers on its underside which cooperate with a guide rail disposed centrally in a narrow aisle of a storage facility. The rollers and guide rail cooperate to provide lateral and longitudinal stability for the lift truck thereby permitting stacking and retrieving of rated capacity loads at greater heights. In one embodiment the rear stabilizing rollers are mounted on a trolley which is connected to the truck steering mechanism whereby the steering of the truck is automatically corrected to maintain proper truck alignment on the stabilizing guide rail.

3,814,027
GUIDE TRACK FOR A STAIRWAY ELEVATOR
Robert M. Vice, 907 Ellsworth Ave., Columbus, Ohio 43206
Filed Nov. 14, 1972, Ser. No. 306,387
Int. Cl. E01b *2/00*
U.S. Cl. 104—247 **4 Claims**



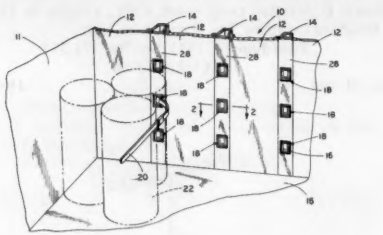
A guide track for the roller-mounted carriage of a stairway elevator composed of a plurality of identically formed end-adjoining, channel-shaped track sections formed on their outer side and base walls with longitudinally coextensive, undercut grooves in each of which is positioned an adjustable connector bar or key for joining or splicing the relatively abutting ends of the track sections in exacting axial alignment without resort to the formation of bolt-receiving openings in the track sections, and wherein said track sections are so constructed as to define therein at least three, relatively spaced, longitudinally extending roller guideways adapted to receive the rollers of a longitudinally moveable elevator carriage and to support such carriage for longitudinal rolling movement along said track sections while preventing any substantial lateral or vertical displacement of the carriage in the track sections.

3,814,028
FREIGHT CAR WITH DEPRESSED CENTER SECTION
Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Company, Chicago, Ill.
Filed Apr. 9, 1973, Ser. No. 349,593
Int. Cl. B61d *17/00*
U.S. Cl. 105—366 R **5 Claims**



A freight car having end doors adapted to carry large bulky commodities by providing a depressed or lowered center section extending between the spaced trucks, thus permitting the stacking of large commodities which would ordinarily not be permissable due to the restrictive car height limitations. The freight car also includes a trolley mounted crane which permits rapid and efficient loading and unloading of cargo.

3,814,029
LADING STRAP ANCHOR
George S. McNally, South Holland, Ill., and Roger D. Sims, Munster, Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed Mar. 30, 1973, Ser. No. 346,502
Int. Cl. B61d *45/00*
U.S. Cl. 105—369 A **7 Claims**

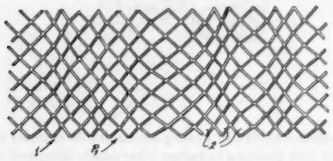


A lading strap anchor is recessed in the side wall post of a railway freight car and has a rotatable band attaching handle member which is movable out of a side wall opening to provide for attachment of strap anchors. Each anchor unit also includes an arcuate guide portion which is useful in directing straping into the attaching handle. A retaining clip may be provided to retain the handle within the side wall recess. Modified version of the invention includes a rubber biasing member which abuts the rotatable handle and provides a restoring force to move the handle into the side wall nest after straping is removed.

3,814,030
FORAMINOUS SUPPORT PLATFORMS
Richard J. Morgan, III, 736 S. Washington St., Van Wert, Ohio 45891
Filed Aug. 4, 1971, Ser. No. 168,997
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **2 Claims**

Foraminous support platforms capable of supporting objects in spaced relation to a floor or other supporting surface and which permit air circulation and/or liquid drainage through and around the platforms with respect to the objects

supported thereon. The platforms can be constructed in a wide variety of structural forms and are formed of a mesh or mesh-type netting or screen fabric which can be produced with the desired physical and chemical properties depending on its intended end use. These platforms are capable of being used in a wide variety of environments and for a large number of intended uses. An exemplary, but non-limiting number of embodiments of the subject support platforms are disclosed herein and taught by the present invention. Some embodiments employ a single corrugated mesh or mesh-like fabric and other embodiments employ a corrugated mesh or a mesh-type member with a second relatively flat mesh-like sheet



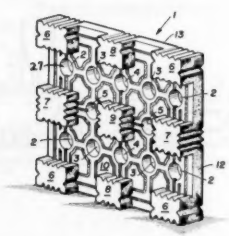
secured to the corrugation peaks of a corrugated member. A further embodiment includes a corrugated mesh-like fabric member with flat mesh-like sheet members secured to the peaks on both of the opposite sides of the corrugations of a corrugated member. Still another embodiment includes a relatively flat mesh-like sheet member with a plurality of support members or legs secured to one surface thereof at spaced locations. The invention also teaches the use of foraminous platforms formed of various layers comprising combinations of corrugated flat sheets and/or spaced support elements. The present invention also resides in various methods of making the disclosed platforms.

3,814,031

PLASTIC PALLETS

Timothy J. Fowler, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 26, 1972, Ser. No. 257,268
Int. Cl. B65d *19/00*
U.S. Cl. 108—51 **2 Claims**



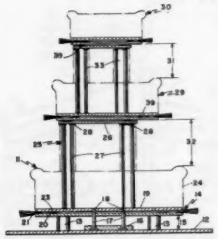
A hollow molded unitary plastic pallet is provided for use in handling and transporting cargo, particularly with forklift trucks. The pallet comprises upper and lower surfaces with legs disposed on the lower surface. Reinforcement of the pallet is achieved by means of holes through the pallet surfaces and by means of reinforcing grooves disposed on the legs and on the lower surface of the pallet. The grooves on the lower surface extend from the holes to the legs and continue down along the length of the legs to their bases.

3,814,032

DISPOSABLE PILLAR SET FOR CAKES

Standlee N. McMains, 234 Guana Ave., Chula Vista, Calif. 92010

Filed Nov. 13, 1972, Ser. No. 305,962
Int. Cl. A47g *19/03*
U.S. Cl. 108—101 **7 Claims**



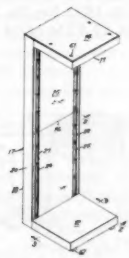
A disposable pillar set comprising a plurality of disposable pillars and platforms which are assembled to form the supporting structure for the layers of a tier cake, each layer having its individual paper cake circle and lace board and a cake carrier to support the assembled tier cake. The disposable pillars are scissile to allow cutting to produce varying interspaces between cake layers, and the cake carrier provides a finger space to facilitate handling and transporting the completed tier cake with fastening means positively preventing the lowermost lace board and cake circle from inadvertent sliding.

3,814,033

C-FRAME STRUCTURAL MODULE

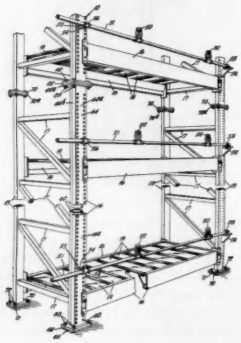
Emil A. Rudat, North Reading, and Edwin J. Medler, Millbury, both of Mass., assignors to Innovations Incorporated, Worcester, Mass.

Filed Sept. 1, 1972, Ser. No. 285,940
Int. Cl. A47b *9/00*
U.S. Cl. 108—108 **10 Claims**



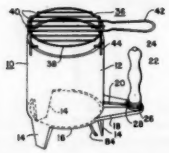
A C-shaped core module constructed of metal skeletal elements, a number of which are embedded in rigid self-skinned polyurethane foam, assembled so that the polyurethane foam material provides both strength and a decorative finish, the module being adapted to accomodate and support sinks, shelves, cupboards, storage cabinets, drawers, hangers, electrical and lighting fixtures and plumbing arrangements useful in hospital pharmaceutical units, laboratories, and various mobile assemblies such as marketing displays.

3,814,034
LOAD SUPPORTS FOR STORAGE STRUCTURES
Edward A. Seiz, 136 E. Third St., Lansdale, Pa. 19446
Division of Ser. No. 134,618, April 16, 1971, Pat. No. 3,720,268, which is a continuation-in-part of Ser. No. 15,998, March 3, 1970, Pat. No. 3,626,487, which is a continuation-in-part of Ser. No. 728,182, May 10, 1968, Pat. No. 3,545,626. This application Oct. 27, 1972, Ser. No. 301,469
Int. Cl. A47f 5/00
U.S. Cl. 108—111 7 Claims



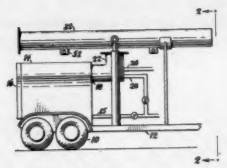
A storage structure having a pair of horizontally-disposed parallel load beams is provided with a series of load-carrying members which are fastened in spaced parallel relation to the beams. Each member has a pair of longitudinal flanges, and each beam has a series of upstruck ears located at spaced intervals along its length. The ears are deformed against and interlock with the flanges during assembly to secure the members against movement.

3,814,035
PORTABLE FUEL IGNITER
Glenn A. Miller, 1004 Hillcrest Dr., Greensburg, Pa. 15601
Filed May 30, 1972, Ser. No. 258,051
Int. Cl. F23q 13/04
U.S. Cl. 110—1 F 12 Claims



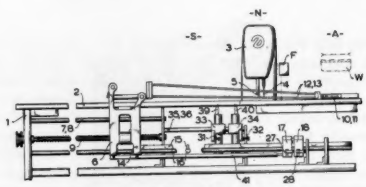
A solid fuel igniter has a fuel container shaped for a chimney effect, a fuel supporting grate and an ignition arrangement mounted in a lower end portion of the container. The container end portion is provided with combustion air access. A handle support is coupled to the container end portion and extends outwardly and laterally thereof, and a heat insulating handle is secured to an outer end portion of the handle support and extends upwardly therefrom. The handle is thereby spaced from the container to facilitate grasping thereof.

3,814,036
STACK LIFTING DEVICE
Ralph E. Fanton, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed May 25, 1973, Ser. No. 357,979
Int. Cl. F23g 5/00
U.S. Cl. 110—18 R 6 Claims



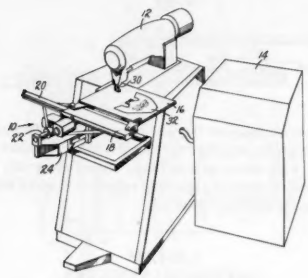
A mobile incinerator having a detachable exhaust stack that is raised and lowered between a vertically disposed operating position and a horizontally disposed inoperative position by a suitable jacking arrangement. The stack is supported on trunnions at its center of gravity whereby it is pivotally balanced so that when carried entirely by the trunnions, little effort is needed to rotate the stack about its pivot point to obtain perfect alignment between the stack and the incinerator whereby an attachment thereto may be readily effected.

3,814,037
SEWING APPARATUS FOR THE FORMATION OF EDGE-PIPING OPENINGS
Karl Nicolay, Bielefeld, Germany, assignor to Durkoppwerke G.m.b.H., Bielefeld, Germany
Filed Aug. 8, 1973, Ser. No. 386,496
Claims priority, application Germany, Aug. 18, 1972, 2240617
Int. Cl. D05b 3/06
U.S. Cl. 112—68 10 Claims



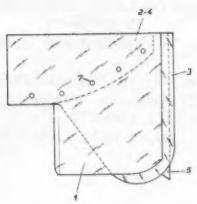
A sewing apparatus for the formation of pocket openings or slits in a fabric workpiece provided with a binder strip or piping comprises a double-needle sewing machine, blade between the needles of the sewing machine for forming the main pocket slits, and a pair of angular cutters respectively entrainable with the fabric transport device for producing angular incisions at each end of the main pocket slit. The transport device includes a slide carriage having a drag rail with which the cutter elements are entrained under the control of a sensor responsive to the leading and trailing edges of the binder strip so that the angular incisions are located properly in spite of variations in the length of the binder strip.

3,814,038
SEWING MACHINE WITH RECIPROCATING WORK SUPPORT MEANS
Adolph S. Dorosz, Beverly; Hans F. Schaefer, Jr., Rockport, and Gordon V. Sprague, Jr., Danvers, all of Mass., assignors to USM Corporation, Boston, Mass.
Division of Ser. No. 192,287, Oct. 26, 1971. This application Jan. 29, 1973, Ser. No. 327,846
Int. Cl. D05b *21/00, 75/00*
U.S. Cl. 112—121.15 3 Claims



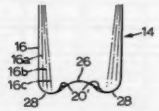
Apparatus having a pallet for supporting a workpiece for movement relative to a tool. The pallet is removably mounted on moving means operative to move the workpiece on the pallet relative to the tool. The moving means comprise a movable support for the pallet, motive means, and a resilient, arcuate interconnection between the support and the motive means. The pallet has means for securing the workpiece against movement relative to the pallet and an aperture for providing tool access to portions of the workpiece where the tool operates on the workpiece.

3,814,039
AUTOMATIC GUIDE DEVICE FOR SEWING MACHINE OR MACHINE FOR ASSEMBLING TWO OR MORE SUPERPOSED ELEMENTS
Wolfgang Heiler, Soufflenheim; Rudolf Muller, Sessenheim, and Jean-Jacques Becker, Bischheim, all of France, assignors to Vestra-Union S.A., Paris, France
Filed May 18, 1972, Ser. No. 254,753
Int. Cl. D05b *35/10*
U.S. Cl. 112—153 1 Claim



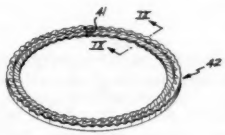
The disclosure is of a device permitting the automatic guidance of two or more workpiece elements with different edge profiles being passed through and joined together in a sewing or welding machine, the device comprising two or more lateral guide plate and one or more intermediate plates disposed between an upper plate and a base piece.

3,814,040
METHOD OF FORMING A TAPERED CONTAINER
Michael B. Habash, Don Mills, Ontario, Canada, assignor to Advanced Extrusions Limited, Penetang, Ontario, Canada
Filed May 2, 1973, Ser. No. 356,437
Int. Cl. B21d *51/00*
U.S. Cl. 113—120 M 6 Claims



A method of forming a tapered container, in which an impact extruded cylindrical container is used as a starting member. The bottom of the cylindrical container is domed upwardly, displacing the thickneed bottom edge of the container radially inwardly and forming a new bottom edge. The new bottom edge is then drawn upwardly to reduce the diameter of the container at its bottom, forming a tapered container.

3,814,041
METHOD OF MAKING END RINGS FOR CYLINDRICAL CONTAINERS
Michael Eugene Redd, and Robert Clyde Rieke, both of Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
Filed Apr. 18, 1973, Ser. No. 352,163
Int. Cl. B21d *51/44*
U.S. Cl. 113—121 C 7 Claims

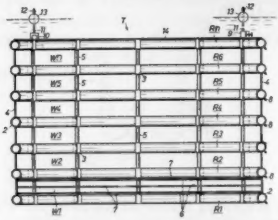


A method of forming can end rings from linear flat strip stock first establishes a plurality of flutes along one edge of the flat stock. This causes a circular shape to be formed having two free ends. The free ends are joined together and the thusly formed ring is then pressed into the finally desired channel shaped end ring. One method of forming the flutes does so in a continuous manner such that a helix is formed which must then be cut at proper intervals. An alternate method forms rings from individual pieces of flat strip stock.

3,814,042
SUBMARINE TANK AND METHOD OF FABRICATING
Tomoyuki Hirowatari; Tomomichi Kurihara; Akihisa Kokumai; Toru Hori, and Takaaki Tanimoto, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan
Filed Sept. 17, 1970, Ser. No. 72,999
Claims priority, application Japan, Sept. 24, 1969, 44-76436; Sept. 24, 1969, 44-76437
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 T 6 Claims

A submarine tank is provided by joining pipes end to end to form a first hollow ring. Vertical side plates are then secured to the pipes with each two adjacent side plates joined together to form a fluid-tight first peripheral wall on the first ring. At least one bottom plate having a plurality of holes is thereafter fixed to the inner face of the first peripheral wall. In the same manner as with the first ring, a second hollow ring is built on

and joined to the first peripheral wall. By supplying sea water into the first ring the structure already fabricated is lowered into the sea to a level suitable to the subsequent construction work. In the same manner as above, a second to *n*th peripheral



walls and a third to *n*th hollow rings are alternately built to obtain an upwardly extending joined structure while the structure already fabricated is progressively lowered. Finally, a cover plate is fixed to the *n*th hollow ring.

3,814,043

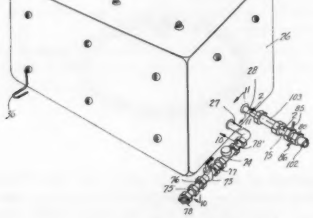
SHIP SALVAGE APPARATUS

Leo Martin Krout, 178 West St., Wadsworth, Ohio 44281

Filed July 25, 1972, Ser. No. 275,064

Int. Cl. B63c *7/12*

U.S. Cl. 114—54 **18 Claims**



Apparatus for salvaging sunken vessels or other sunken objects having enclosures. The apparatus includes inflatable flexible containers which are generally shaped to fit, when inflated, in rooms or enclosures of the sunken vessels or objects to be salvaged. The containers, normally in folded deflated condition, are adapted to be placed by divers in the rooms or enclosures for subsequent inflation. The containers are provided with flexible inlet and outlet air hoses, the inlet hoses having check valves and filling control angle valves, and the outlet hoses having combination automatic pressure-retention, pressure-release, manually releasable air discharge valves, the air discharge valves acting to cause the containers to remain inflated after initial filling, while providing automatic control of air release as the sunken vessel or object rises, to compensate for changing hydrostatic pressure and to avoid damage to the containers or structures adjacent thereto. The apparatus includes compartment door and porthole container-retenion devices and the containers are provided with outside straps and tie rings for securing the containers in desired buoyancy areas. Quick action couplings are employed for connecting the associated compressed air supply source through the inlet hoses or between the various valves or hoses and extension hoses, if used. Hose retention bracket assemblies are provided to hold the hoses fixed relative to the enclosures when the containers are inflated.

3,814,044

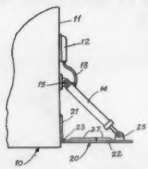
BOAT LEVELER TAB

Frank T. Kercheval, Pasadena Hills, Pasadena Hills, Mo. 63121

Filed Nov. 7, 1972, Ser. No. 304,551

Int. Cl. B63b *1/22*

U.S. Cl. 114—66.5 P **1 Claim**



A boat leveler member formed of a single molding of plastic material integrally hinging together the hinge bracket and the leveler tab, with motor piston hinge bosses integrally molded to the tab and, if desired, rigidifing ridges or the like being also molded into the surface of the tab.

3,814,045

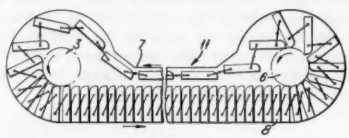
AMPHIBIOUS VEHICLES

Robert Gray, Nouale Cottage, Nouale Ln., Hightown, near Ringwood, England

Filed July 19, 1971, Ser. No. 163,808

Int. Cl. B60f *3/00*

U.S. Cl. 115—1 R **4 Claims**



The invention relates to an amphibious vehicle for the transport of passengers and/or cargo over land, soft mud or water. The vehicle is supported and propelled by two or more tracks in the form of endless belts each of which comprises a series of inter-linked open ended boxes and which are trained about wheels or sprockets, driven by a suitable engine. Steering of the vehicle is effected by retarding one of the belts with respect to the other.

3,814,046

VEHICLE FOR USE ON LAND, IN WATER, ON ICE AND IN SNOW

Bengt Erland Ilon, Norr Malarstrand 76, 4 tr, Stockholm, Sweden

Filed Sept. 27, 1972, Ser. No. 292,689

Claims priority, application Sweden, Sept. 29, 1971, 12347/71; Sept. 19, 1972, 12099/72

Int. Cl. B62d *55/08*

U.S. Cl. 115—1 R **8 Claims**

A vehicle for use on land, in water, on ice and in snow, comprising a vehicle body supported by at least one expansible in-

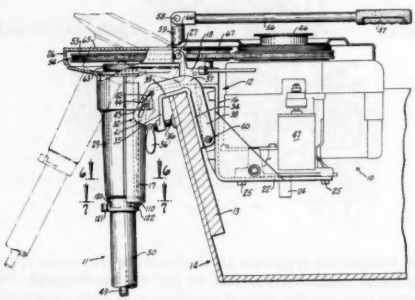
vaginated pillow-like container that is driven by means of a belt extending between the intermediate layers of the container and in the longitudinal direction of the same.

3,814,047

INBOARD-OUTBOARD BOAT PROPELLING APPARATUS

James L. Carpenter, 10649 W. Donges Bay Rd. 104N, Mequon, Wis. 53092

Filed July 21, 1972, Ser. No. 274,090
Int. Cl. B63h 21/26
U.S. Cl. 115—35 10 Claims



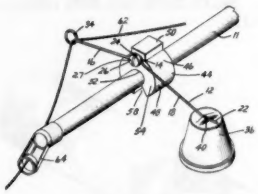
Boat propelling apparatus securable to the transom of a boat and comprising an inboard prime mover and an outboard propeller unit having its propeller shaft driven from the drive shaft of the prime mover by a belt which extends over the top of the transom. A rigid supporting structure of substantially inverted U-shape provides a common mounting means for the prime mover and the propeller unit. The legs of the supporting structure straddle the transom of a boat having the apparatus mounted thereon, and the prime mover is carried by the inboard leg while the propeller unit is carried by the bight bridging the upper ends of the legs.

3,814,048

AUDIBLE INDICATOR FOR USE WITH FISHING ROD

James C. Bartholomew, R.R. 1 Box 12, Ft. Pierce, Fla. 33450

Filed May 21, 1973, Ser. No. 361,966
Int. Cl. G08b 3/00
U.S. Cl. 116—67 R 1 Claim



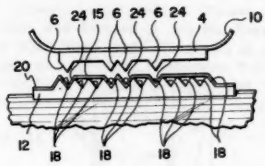
An audible indicator for use with a fishing rod having a fishing line coupled thereto, the indicator comprising an elongated member and means for movably clamping the member to a fishing rod. A guide element and a bell are coupled to the member at points thereon distal to the clamping means and the fishing line is slidably received through the guide element whereby the bell is caused to ring in response to movement of the fishing line through the guide element.

3,814,049

PATIENT IDENTIFICATION SYSTEM

DeWitt T. Hunter, 1407-Lincoln Way, Auburn, Calif. 95603

Filed Aug. 31, 1972, Ser. No. 285,402
Int. Cl. G01d 21/00
U.S. Cl. 116—114 R 7 Claims



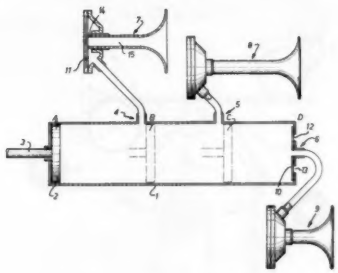
A patient identification system comprising a master identification device including a master identification tab formed with a plurality of selectively removable projections disposed in a row protruding from one surface thereof, attaching means for securing said master tab to a patient to be identified thereby, a subordinate identification tab formed with a plurality of recesses in one surface thereof preferably greater in number than the number of said projections on an unencoded master tab, and a strip of pressure-adhesive material secured to said subordinate tab and extending tautly over said recesses.

3,814,050

MULTITONE AIR BLAST HORN

Bertrand Antoine Warnod, Neuilly-sur-Seine, France, assignor to KLAXON, Neuilly-sur-Seine, France

Filed Aug. 9, 1972, Ser. No. 279,249
Claims priority, application France, Aug. 12, 1971, 71.29592
Int. Cl. G10k 5/00
U.S. Cl. 116—140 6 Claims



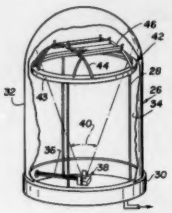
This multitone air blast horn system comprises an air generator, an air distributor and a plurality of acoustic horns; said air generator consists of a piston pump and the distributor consists simply of the pump body formed to this end with a plurality of outlet ports communicating with the corresponding acoustic horns, respectively.

3,814,051

CONTACT LENS AND APPARATUS FOR PRODUCING SAME

Lawrence Lewison, Briarwood Crossing, Lawrence, N.Y. 11559

Filed Nov. 29, 1972, Ser. No. 310,391
Int. Cl. C23c *13/08*
U.S. Cl. 118—49 **1 Claim**



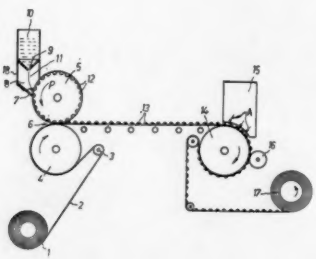
Rectilinear lens holders span arcuate supports which are radially uniformly disposed with respect to a vapor source of the hydrophilic material. Each holder has an adhesive surface means whereby to attach said lenses.

3,814,052

APPARATUS FOR APPLYING A THERMOPLASTIC MATERIAL IN THE FORM OF MUTUALLY ISOLATED DEPOSITS TO A SURFACE STRUCTURE

Hans-Peter Caratsch, Itenhard 16, 5620 Bremgarten/AG, Switzerland

Filed May 8, 1972, Ser. No. 251,027
Claims priority, application Switzerland, May 10, 1971, 6842/71
Int. Cl. B05c *1/04*
U.S. Cl. 118—60 **10 Claims**



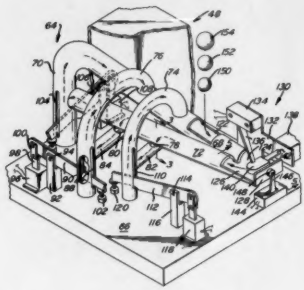
An apparatus for applying a thermoplastic material in the form of deposits which are spaced from one another to a surface structure by means of a roller rolling upon the surface structure and provided at its outer surface with recesses formed in accordance with the configuration, size and distribution of the deposits. A doctor element cooperating with the roller forms therewith a gap, and there is also provided means for infeeding the thermoplastic material into the gap in the form of a foil which is in a plasticized condition.

3,814,053

APPARATUS FOR SELECTIVE APPLICATION OF LIQUID WAX TO VEHICLES

Dan A. Andersen, Duarte, Calif., assignor to Sherman Supersonic Industries Western, Inc., Monrovia, Calif.

Division of Ser. No. 814,778, April 9, 1969. This application Apr. 6, 1971, Ser. No. 131,620
Int. Cl. B05c *5/00*
U.S. Cl. 118—2 **6 Claims**



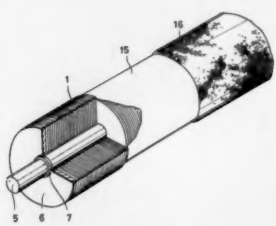
A method and apparatus are disclosed for selectively applying liquid media such as wax or the like, to vehicles. The method includes the steps of providing a plurality of differing discrete physically sensible indicia representing selection of the desired treatment for a given vehicle, and sensing the nature of the indicium for such vehicle. Suitable indicia, in one form of the invention, are metallic balls of different dimensions and magnetic properties. Sensing of the nature of the selected indicium and sensing of the vehicle to be treated in an area adjacent an applicator apparatus provide a control input for the applicator apparatus, so that the selected medium may be applied to the vehicle. One form of an apparatus for performing the method includes a conduit, a plurality of signal means of different sizes and properties adapted to be received in the conduit, and means associated with the conduit for sensing the nature of the signal means to thereby control the applicator apparatus.

3,814,054

FIBROUS ROLL IMPREGNATED WITH DEVELOPER LIQUID AND METHOD OF MAKING SAME

Michio Tajihi, Osaka, Japan, assignor to Kabushiki Kaisha Yamamoto Kogyosho, Nagoya City, Japan

Filed Oct. 19, 1972, Ser. No. 300,777
Claims priority, application Japan, Aug. 29, 1972, 47-85852
Int. Cl. B67d *3/00;* **B05c** *1/06*
U.S. Cl. 118—258 **5 Claims**



A roll and method of making same which is impregnated with a large amount of a developer liquid while substantially excluding ambient air. The pressure of rolling causes the liquid to ooze out of the peripherial surface of the roll in small

fixed quantities and to be transferred to sheet material such as paper rolled therewith. Such a roll is capable of copying for an extended period of time without replacement and without necessity of replenishment of the developed liquid.

3,814,055

DEVICE FOR APPLYING STRIP-SHAPED ADHESIVE COATINGS TO PAPER, CARDBOARD AND THE LIKE

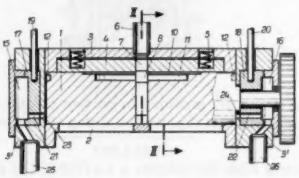
Kurt Stemmler, Neuwied, Germany, assignor to Winkler & Dunnebier, Neuweid am Rhein, Germany

Filed May 15, 1972, Ser. No. 253,127

Claims priority, application Germany, May 17, 1971, 2124467

Int. Cl. B05c *5/02*

U.S. Cl. 118—410 **2 Claims**



A device for producing strip-shaped coatings of adhesive substance on moving webs or blanks, preferably of paper, board or the like, utilises a cylinder, rotating at the rhythm of the strips to be applied, having a longitudinal and annular groove and being surrounded on all sides by a housing with the exception of a narrow discharge slit required for transferring the adhesive substance. The device is particularly characterised in that a longitudinal groove extending at an angle or in herringbone pattern relative to the cylinder axis always provides a point of intersection which travels from one side to the other if the discharge slit is disposed perpendicularly relative to the paper direction for applying herringbone pattern coatings and is disposed at an angle to the paper direction for coatings to be applied transversely relative to the paper direction and in that the longitudinal groove communicates through a housing bore and duct with an annular groove connected to a glue storage container.

3,814,056

APPARATUS FOR REMOVING TEAT CUPS

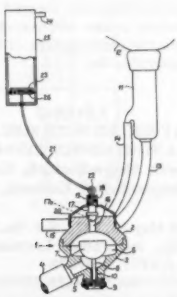
Vaino Maehans, Sodertalje, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 16, 1973, Ser. No. 351,653

Claims priority, application Sweden, May 3, 1972, 5784/72

Int. Cl. A01j *9/08*

U.S. Cl. 119—14.08 **4 Claims**



Upon actuation of a device for pulling the teat cup cluster from the udder, the device opens a normally closed valve to admit air to the interior of the milk claw, whereby milk is flushed from the claw into the milk discharge hose, and the vacuum in the claw is reduced to permit easy removal of the teat cups.

3,814,057

SEPARATOR FOR NEGATIVELY PHOTOTACTIC HOUSE FLY LARVAE FROM CHICKEN HEN EXCRETA

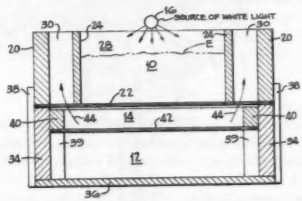
Corlette C. Calvert, Laurel; Neal O. Morgan, Silver Spring, both of Md., and Richard D. Martin, Tucson, Ariz., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 113,470, Feb. 8, 1971, Pat. No. 3,716,371.

This application July 28, 1972, Ser. No. 276,208

Int. Cl. A01k *29/00*

U.S. Cl. 119—15 **2 Claims**



An apparatus for separating negatively phototactic house fly larvae from chicken hen excreta and collecting the larvae to allow them to pupate comprised of two compartments, an upper one having a screened floor and a lower one having a solid floor, a screened tray fitted into the lower compartment and a source of white light. Chicken hen excreta in the upper compartment is seeded with house fly eggs, the eggs are allowed to hatch and the larvae to tunnel and aerate the manure, thus deodorizing and reducing the moisture content of the manure by more than 50 percent. The larvae migrate out of the manure and pupate in the lower compartment. When dried and ground the pupae can be used as a protein source for growing chicks.

3,814,058

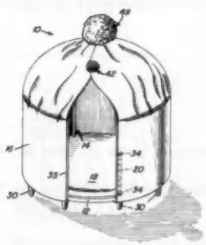
PET BED

Milo L. Thompson, 4812 Adams St., Lincoln, Nebr. 68504

Filed Apr. 3, 1973, Ser. No. 347,482

Int. Cl. A01k *1/02*

U.S. Cl. 119—19 **8 Claims**



A pet bed having a framework connected to a base and partially enclosed by a cover. Connectors retain the legs of U-shaped members of the framework in holes provided in the base. The legs of the U-shaped members extend through the holes in the base and through eyelets, grommets, and the like.

in one side of a rectangular periphery of a planar strip forming the cover to retain the U-shaped members and cover on the base. Each end of the cover has further eyelets arranged to receive a leg of associated U-shaped members cooperating to define an animal ingress and egress opening. A draw-string and a shank button assembly close the cover about the upper, or bight, portion of the framework.

3,814,059

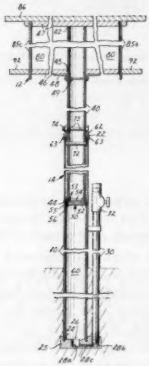
HYDRAULICALLY ELEVATED BIRDHOUSE CONSTRUCTION

John K. Eickhof, Box 598, Crookston, Minn. 56716

Filed Dec. 16, 1971, Ser. No. 208,800

Int. Cl. A01k *31/00*

U.S. Cl. 119—23 **10 Claims**



A hydraulically raisable and lowerable birdhouse construction comprising a nesting structure mounted on a telescopic pole assembly. The birdhouse is raisable by the introduction of a fluid (e.g. water) into a rigidly mounted, outer pole section elevating a telescopic, inner pole section and the birdhouse attached thereto. The birdhouse is retained in its elevated position by suitable means (e.g. a holding bolt engaging both the inner and outer pole sections) and the water allowed to escape from the outer pole section through a weep hole therein. To facilitate maintenance of the lowered birdhouse, the outer shell (i.e., the exterior walls and roof) is entirely removeable so as to fully expose the internal nesting structure.

3,814,060

HEAD GATE

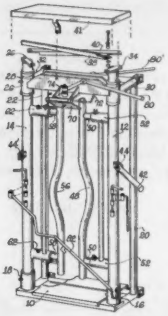
Marvin E. Swenson, 1100 E. 38th St., Sioux Falls, S. Dak. 57105

Filed Aug. 17, 1972, Ser. No. 281,463

Int. Cl. A01k *1/06*

U.S. Cl. 119—98 **6 Claims**

A head gate for restraining animals, including a pair of spaced frame members pivotally mounted on a base and having gate members attached thereto adapted to engage an animal therebetween when the gate members are in a closed position. A pair of crossed, rigid connecting arms are connected to the upper portion of the frame members to provide synchronous pivotal movement of the frame members in opposite directions in response to pivotal displacement of one of the frame members to open and close the gate members.



Locking means are provided to prevent pivotal displacement of the gate members to prevent opening of the gate members.

3,814,061

DEVICE FOR SECURING A VAPORIZABLE ACTIVE SUBSTANCE TO AN ANIMAL COLLAR

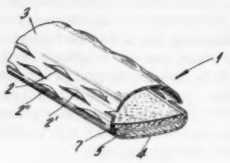
Robert Aries, Paris; Armand Dechaumet, Mont-de-Marsan, and Paul Dupre, Gagny, all of France, assignors to Dynachim (Societe a responsabilite limitee), Paris, France

Filed Feb. 8, 1972, Ser. No. 224,506

Claims priority, application France, Feb. 8, 1971, 71.04112; Feb. 8, 1971, 7104136; Apr. 1, 1971, 71.11509

Int. Cl. A01k *27/00*

U.S. Cl. 119—106 **8 Claims**



A device for securing a vaporizable active substance, such as an insecticide, deodorant, and the like to an animal collar so that the vapors are directed away from the skin of the animal. The device includes a container for the active substance in the shape of a tubular member, envelope or sheath formed of a flexible material or of a hollow medallion. Openings are provided in the container so that they direct the vaporized active substance outwardly away from the animal's skin. Attachment members are secured to the container for fixing it to the animal collar. Alternatively, an adhesive strip can be formed on the inner surface of the container for attaching it to the animal collar.

3,814,062

WASTE HEAT BOILER WITH BOILER WALLS AND WALL PORTIONS OF FINNED PIPES

Frohmut Vollhardt, Siegen-Burbach, Germany, assignor to Siegener Aktiengesellschaft Geisweid, Huttentat-Geisweid, Germany

Filed May 25, 1973, Ser. No. 363,941

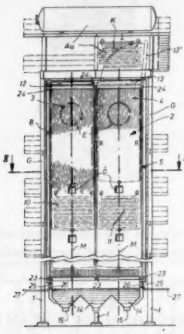
Claims priority, application Germany, May 27, 1972, 2225971; Feb. 17, 1973, 2307870

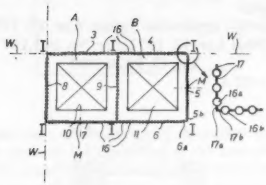
Int. Cl. F22b *37/00*

U.S. Cl. 122—6 A **8 Claims**

A waste heat boiler in which a support frame which is symmetrical about a central vertical axis has planar wall members supported thereon and forming an enclosure. Each wall

member is symmetrical about a central axis and has flow passages with symmetrically located inlets and outlets. Each wall member is reversible on the support frame to present





either face to the inside of the boiler and at least some of the wall members are identical so as to be receivable in several places on the frame. The boiler also has a ceiling member which is tiltable and which is also reversible.

3,814,063

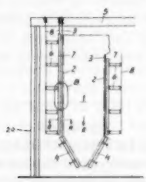
SUPPORT OF TUBE WALLS

Hans Bijmholt, Duisburg, Germany, assignor to Babcock & Wilcox Limited, London, England

Filed July 13, 1973, Ser. No. 379,050

Int. Cl. F22b *37/24*

U.S. Cl. 122—6 A **4 Claims**



A buckstay system for supporting and reinforcing the tubular walls of a vapor generator including a grid adjacent to the walls and means permitting vertical and horizontal movement between the grid and the adjacent wall along the plane thereof.

3,814,064

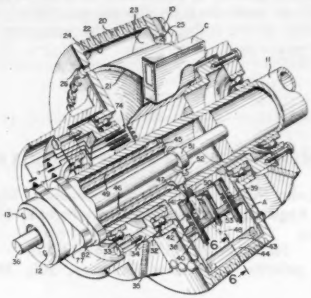
ROTARY INTERNAL COMBUSTION ENGINE

Arnold Loyd Hanes, 21149 W. Entrada Rd., Topanga, Calif.

Filed Nov. 16, 1972, Ser. No. 307,132

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.17 **20 Claims**



A rotor is mounted off center within a cylinder such that a peripheral portion of the rotor always tangentially engages the inner wall of the cylinder to provide a seal at the point of tangency. The rotor is provided with radially slidable blades engaging the inner wall of the cylinder so that a variable volume is defined between successive blades and the point of tangency as the rotor and cylinder rotate about their respective axes. Each of the blades includes a combustion chamber timed to fire as it passes the point of tangency of the rotor with the cylinder, the seal at the point of tangency confining an expanding mixture of burning gas and air within the volume behind each blade as it passes the point of tangency to thereby provide a driving force on the rotor. Novel features of the rotary engine include holding off of the blades from engagement of the inner wall of the cylinder during a portion of the rotation cycle to decrease friction, providing for an adjustable preloading of the engagement force at the point of tangency of the rotor with the cyliner in accord with pressure of expanding gases to insure the integrity of the seal, and the arrangement of suitable exhaust and inlet openings in the cylinder side walls enabling two cycle operation.

3,814,065

COMBUSTION ENGINE WITH ADDITIONAL AIR INLET VALVE

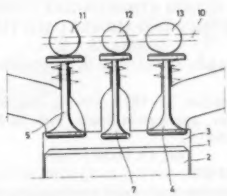
Rfinhard Gospodar, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Nov. 27, 1970, Ser. No. 93,134

Claims priority, application Germany, Dec. 11, 1969, 1962114

Int. Cl. F02b *41/00*

U.S. Cl. 123—26 **4 Claims**



A combustion engine comprising at least one cylinder and an associated piston defining a combustion chamber, an inlet valve for the entry of the fuel mixture into the combustion

chamber, an outlet valve for the outlet of the exhaust gases from the combustion chamber, a cam arrangement for operating the inlet and outlet valves, an additional air inlet valve provided for the combustion chamber and an additional cam associated with the controlling arrangement for controlling the opening and closing of the additional air inlet valve so that a predetermined quantity of pressurized air from an associated pressurized air producer is let into the combustion chamber during a time period falling between the firing time and the end of the power stroke of the piston.

3,814,066

AIR COMPRESSING INTERNAL COMBUSTION ENGINE WITH DIRECT INJECTION

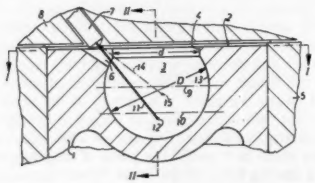
Joachim Lohr, Nuremberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Germany

Filed July 28, 1971, Ser. No. 166,675

Claims priority, application Germany, July 31, 1970, 2038048

Int. Cl. F02b *1/12*

U.S. Cl. 123—32 R **1 Claim**



An air compressing direct injection internal combustion engine in which either the reciprocatory piston or the pertaining cylinder head has a ball-shaped combustion chamber therein which is provided with a neck that is constricted with regard to the diameter of said combustion chamber and which is adapted so to receive the combustion air as to circulate the same in said combustion chamber, the ratio of the diameter of the said combustion chamber to the diameter of said neck being less than or at the maximum equalling 1.15 while the fuel injection nozzle is so directed toward the inside of said combustion chamber that the point of impact of the fuel jet upon the inside surface of said combustion chamber is located in that quarter of the combustion chamber which is remote from and opposite to said constriction.

3,814,067

INTERNAL COMBUSTION ENGINE COMBUSTION CHAMBER DESIGN AND AIR/FUEL MIXTURE SUPPLY MEANS

Manuel Guadalajara De La Fuente, Hermosilla 87, Madrid, Spain

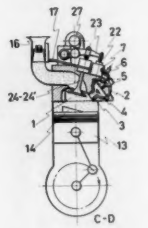
Filed Jan. 31, 1972, Ser. No. 221,949

Claims priority, application Spain, Feb. 8, 1971, 388072; Jan. 24, 1972, 399152

Int. Cl. F02b *17/00*

U.S. Cl. 123—32 ST **1 Claim**

An internal combustion engine combustion chamber design and air/fuel mixture supply means comprising a piston means, a principal combustion chamber defined in part by said piston means and communicating with a precombustion chamber by way of an aerodynamic section nozzle, a carburetor adapted to provide individual qualitative control of separate air/fuel mixtures for said principal chamber and said precombustion chamber, the supply of mixture to said precombustion chamber being by way of a feeder means which controls mixture flow to spray located in said precombustion chamber.



3,814,068

COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE OF DIRECT INJECTION TYPE

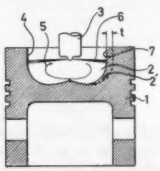
Motoyasu Kimbara, Yokohama City, and Yoshitaka Yoshida, Tokyo, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Claims priority, application Japan, Apr. 15, 1971, 46-23766

Filed Apr. 12, 1972, Ser. No. 243,197

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 A **5 Claims**



Direct injection type internal combustion engine including combustion chambers each formed by a cylinder head, a cylinder liner and a piston head, the piston head having a cavity wherein the air swirl is produced by known means, and fuel injection nozzles each disposed substantially in the center of the each cavity and having a plurality of orifices adapted to direct jets of fuel radially against the cavity wall, said cavity being so constructed that the cavity wall of a generally circular contour is locally extended toward the center of the cavity to form the same number of side portions as the nozzle orifices, consisting of straight lines or nearly straight curves, said side portions being equidistantly spaced apart and interconnected with arcuate curves thereby to form a multilobed or multilateral cavity, and the nozzle orifices are turned and displaced to enable the jets of fuel therefrom to impinge obliquely against said side portions of the cavity wall and be deflected thereby.

3,814,069

INLET MANIFOLDS

Brian Hugh Croft, Coventry, and Denis Anthony Browne, Norwich, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 28, 1971, Ser. No. 212,949

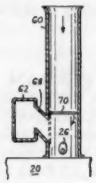
Claims priority, application Great Britain, Jan. 1, 1971, 142/71

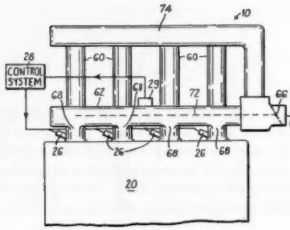
Int. Cl. F02m *23/04, 13/04*

U.S. Cl. 123—52 M **3 Claims**

An inlet manifold for a multi-cylinder internal combustion engine comprises a plenum chamber which has an inlet con-

taining at least one throttle valve and which has a plurality of outlet ducts each adapted to communicate with a respective cylinder of the engine via an inlet valve of the engine. A further valve is associated with each outlet duct which, in use, operates to control the flow of gas through that outlet duct





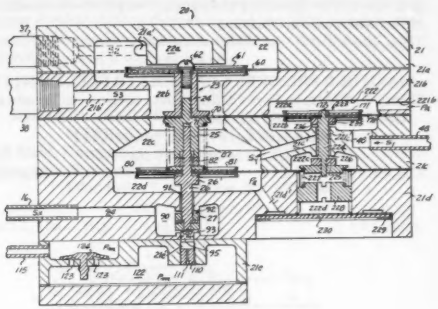
under at least part of the range of operation of the throttle valve which controls the operation of the engine. The further valves may be respectively located in the outlet ducts, or alternatively may be respectively located in ram pipes which are connected one to each outlet duct.

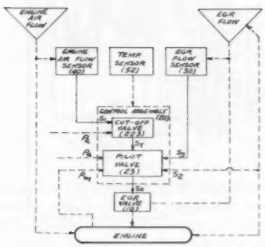
3,814,070
EXHAUST GAS RECIRCULATION FLOW CONTROL SYSTEM

Harry P. Wertheimer, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 26, 1972, Ser. No. 318,150
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **21 Claims**

An exhaust gas recirculation flow control system for an internal combustion engine having valve means responsive to engine air flow and to recirculated exhaust gas flow and adapted to provide a scheduled flow control signal to an exhaust gas recirculation valve. Pressure responsive means are provided to sense engine air flow and recirculated exhaust gas flow so that these two variables may act singly or collectively through said valve means in order to provide exhaust gas recirculation to the engine's intake manifold which begins smoothly and holds at a relatively constant or scheduled fraction of the engine air flow for maximum effectiveness and minimum loss in vehicle driveability. The exhaust gas recirculation control system inhibits exhaust gas recirculation until engine air flow has increased to some predetermined value and then passes exhaust gas to the intake manifold in a modifiable proportional relationship to the engine air flow. If the exhaust gas recirculation flow tends to become too high or too low a force unbalance created within the valve means closes or opens the exhaust gas recirculation valve an amount necessary to maintain a position such that the exhaust gas recirculation flow is controlled in an increasing relationship to the increasing engine air flow. As engine air flow continues to increase a point is reached in which a force unbalance is again created within the valve means causing the exhaust gas recirculation valve to completely inhibit recirculation of exhaust gas. A temperature responsive member may also be included





being operative with the valve means in order to inhibit the flow of exhaust gas at a predetermined low ambient or engine compartment temperature.

3,814,071
COOLANT TEMPERATURE RESPONSIVE EXHAUST CROSSOVER VALVE SYSTEM

Robert M. Buchwald, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1973, Ser. No. 337,416
Int. Cl. F02m *31/00*
U.S. Cl. 123—122 H **2 Claims**

Exhaust gas flow through an exhaust crossover passage in an internal combustion engine from the combustion chamber to the exhaust manifold is regulated by a pair of valves controlled by a thermosensitive motor responsive to engine coolant temperature. The valves divert the exhaust gases through the crossover passage during engine warmup for promoting greater vaporization of liquid fuel in the intake air-fuel mixture. As

the engine coolant temperature rises, the valves are actuated in phase opposition by the motor to gradually close the crossover passage and open the passage to the exhaust manifold thereby thermally isolating the crossover passage when the engine reaches an operating temperature to prevent overheating of the intake air-fuel mixture.

3,814,072

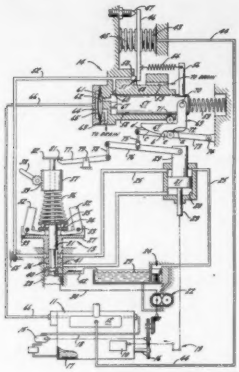
MANIFOLD PRESSURE CONTROLLER FUEL LIMITER

Sidney L. Gillespie, Fort Collins, Colo., assignor to Woodward Governor Company, Rockford, Ill.

Filed June 6, 1972, Ser. No. 260,111

Int. Cl. F02d *23/02*; **F02m** *39/00*

U.S. Cl. 123—179 L **10 Claims**



The fuel flow for starting a turbocharged internal combustion engine is limited by the starting position of a limit control cam which acts as a stop to establish a fuel flow for starting the engine and then moves progressively to change the fuel limit in response to a combination of a build-up of pressure in the lubricating system of the engine and in the manifold by the turbocharger after starting. The stop is returned to the starting position in response to the lube oil pressure decrease incident to stopping the engine. A fuel rate lower than the cam established limit is provided automatically by the speed governor of the engine if the torque demands on the engine are met with less fuel than such limit.

3,814,073

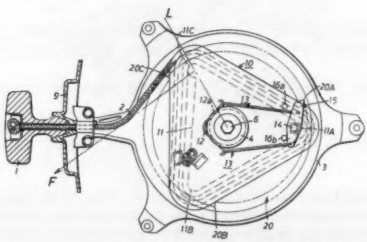
RECOIL ENGINE STARTER

Tsugio Nakatani, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata-shi, Shizuoka-ken, Japan

Filed Aug. 15, 1972, Ser. No. 280,770

Int. Cl. F02n *3/02*

U.S. Cl. 123—185 A **5 Claims**



A recoil engine starter comprising a sheave to operate a crankshaft of an internal combustion engine by drawing a starting rope wound upon the sheave, a spring biasing the sheave in a rope recoiling direction, and a ratchet-and-pawl mechanism selectively transmitting the rotation torque of the sheave to the crankshaft. The sheave comprises a rope winding portion formed in a regular polygonal shape and the ratchet-and-pawl mechanism includes an engaging device to engage the sheave with the crankshaft at a plurality of engaging positions corresponding to the number of apexes of the polygonal shape.

3,814,074

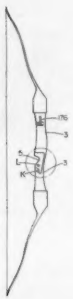
ARCHERY BOW WITH FORCE BALANCING STRUCTURE ASSOCIATED WITH THE HANDGRIP

Brian Wood, 13637 Vernon St., Hazel Park, Mich. 48237

Filed Apr. 13, 1972, Ser. No. 243,662

Int. Cl. F41b *5/00*

U.S. Cl. 124—24 R **19 Claims**



A long bow having limbs of substantially identical length and resistance to bending which are joined by a rigid central portion is improved by pivotally mounting a contoured hand grip upon a fulcrum and adapting the hand grip to abut the rigid central portion of the bow when a reaction force is applied to the hand grip. By coordinating the distances between the fulcrum and the abutting part of the hand grip to the distance between the flexing center of the bow, the line of pull for the arrow, the moments about the fulcrum can be balanced while maintaining an equal deflection of the limbs. The distance between the fulcrum and the abutting part can be made adjustable either by making the fulcrum vertically movable along the rigid central portion or by making the abutting part so movable. Also, the deflection of the bow from a vertical orientation can be measured by an arrow shaped member pivotally mounted to the rigid central portion of the bow which is weighted at its free end and which indicates the degree of tilt on a scale formed on the bow and the adjustment of the distance between the fulcrum and the abutting part can be indicated by a scale.

3,814,075

TAKE DOWN ARCHERY BOW WITH A MOUNT FOR A BOW STABILIZING ELEMENT

Earl H. Hoyt, Jr., 11510 Natural Bridge Rd., Bridgeton, Mo. 65617

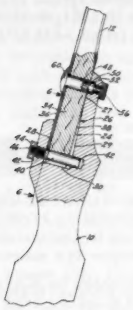
Filed July 21, 1972, Ser. No. 274,095

Int. Cl. F41b *5/00*

U.S. Cl. 124—24 R **9 Claims**

An archery bow with limbs detachably connected to a handle section. The butt end portions of the limbs are freely entered in close fitting relationship between longitudinally spaced forward and rear wall portions of sockets formed in the ends of the handle section. A fixed pin extending fore and aft across the bottom of each socket engages a groove in the end of the limb and a short stud projecting from the rear side of

each limb parallel with the fixed pin and spaced from the end of the limb enters a hole in the rear socket wall in close fitting relationship to position and hold the limbs in lateral alignment. A thumb screw extends through the rear wall of each socket and is threadedly engaged in the short projecting studs



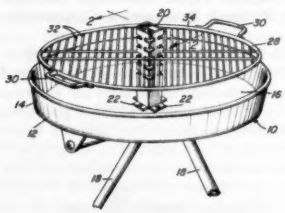
to clamp the limbs to the rear socket walls. The forward socket walls are shorter than the rear walls and a portion of each rear socket wall near the bottom is relieved to permit entry of the limbs in a slightly forward tilted position thereby to permit free entry of the limbs between the socket wall portions and to permit entry of the short projecting studs.

3,814,076

BARBECUE GRILL WITH GRILL HEIGHT ADJUSTMENT MEANS

Matthew S. Zankowsky, Box 535, Mountain Rd., Whitehouse, N.J. 08888, and Robert A. La Patta, Rt. 22, R.D. No. 3, Somerville, N.J. 08846

Filed Mar. 15, 1973, Ser. No. 341,762
Int. Cl. A47j *37/07*
U.S. Cl. 126—25 A **4 Claims**



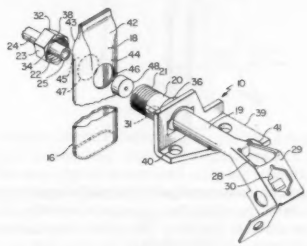
An upstanding center support is provided in the central area of a barbecue fire pan and is of a constant horizontal cross-sectional shape throughout at least a predetermined portion of the height thereof. The cross-sectional shape of the standard or upright is such that it defines circumferentially spaced lobes or corner portions. The lobes or corner portions are formed with vertically spaced sets of horizontally registered outwardly opening notches and a grille member is provided with a central opening of a shape corresponding to the corss-sectional shape of the upright but slightly larger in transverse dimensions. When the grille member is rotated to a position with the lobes or corner portions of the opening registered with the corner portions or lobes of the upright the grille member is freely slidable along the upright. However, when the grille member is horizontally aligned with a selected set of notches and rotated relative to the upright to a position with the lobes or corner portions of the opening out of vertical registry with the lobes or corner portions of the upright the portions of the grille member defining those portions of the center opening intermediate adjacent lobes or corner portions are received in the notches formed in the lobes or corner portions of the upright so as to support the grille member from the upright against vertical shifting therealong and the grille member may therefore be readily adjusted in relation to the fire pan from which the upright is supported.

3,814,077

SNORKEL TUBE BURNER CONSTRUCTION AND METHOD OF MAKING THE SAME

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 17, 1972, Ser. No. 227,134
Int. Cl. F24c *3/10*
U.S. Cl. 126—39 E **10 Claims**



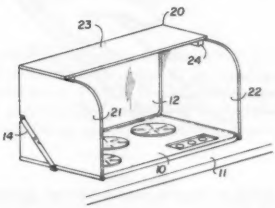
A pilot burner having a tubular inlet for receiving fuel from a source thereof and having an outlet for issuing the fuel therefrom to be burned adjacent such outlet. A conduit is coupled to the inlet for directing the fuel from the source thereof to the inlet. A snorkel tube having an air inlet end and a closed end has an opening passing transversely through the closed end thereof and telescopically receiving the tubular inlet whereby the closed end of the tube is disposed between the burner and the conduit. The tubular inlet has an aperture for interconnecting the interior of the snorkel tube with the interior of the inlet so that air from the snorkel tube mixes with the fuel in the burner before being issued out of the outlet.

3,814,078

PORTABLE STOVE HOOD

Mary C. Etzcorn, 1631 Hickory St., Niles, Mich. 49120

Filed Apr. 2, 1973, Ser. No. 347,141
Int. Cl. F24c *15/12*
U.S. Cl. 126—299 C **1 Claim**



A portable enclosure and safety shield for a counter-top stove which folds up and is removable when not in use. The unit consists of folding sides and a top member which join to the hinged stove cover to segregate the cooking area from adjacent equipment, furniture and draperies.

3,814,079

LIQUID COLLECTING AND FILTERING DEVICE

Raymond F. Le Roy, Sr., Phoenix, Ariz., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 28, 1972, Ser. No. 248,621
Int. Cl. A61b 5/14
U.S. Cl. 128—2 F 8 Claims

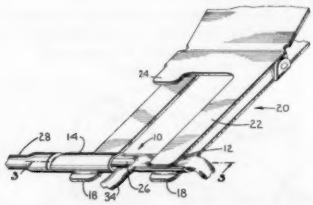
A pair of telescopically arranged tubes defining an expansible, closed chamber in which the pressure is initially and substantially below ambient pressure. The inner tube has an inlet end with a perforable closure member thereon and an outlet end which communicates with the outer tube. A cannula is supported upon said inlet end for movement between a position spaced from said closure member and a position penetrating through said closure member to communicate with said chamber. Filter means is disposed in said inner tube so that liquid moving from the inlet end through the outlet end of said inner tube must pass through the filter.

3,814,080

VESSEL CANNULATOR AND CLAMP FOR LYMPHANGIOGRAPHY

David Norman, Denver, Colo., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Nov. 13, 1972, Ser. No. 305,869
Int. Cl. A61b 17/00
U.S. Cl. 128—2 M 12 Claims



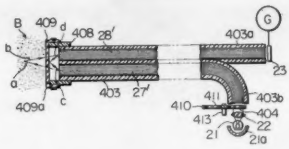
A needle guide is formed with a tubular section and an opened trough section connected thereto in aligned-spaced relationship. A clip member is formed and arranged to releasably engage an open side of the trough section so that a portion of a lymph vessel may be cradled in the trough section and secured by the clip member. During cannulation the clip is held open and a needle is inserted through the tubular section which guides the needle into the cradled portion of the lymph vessel. The clip is then closed and the needle is held in position within the vessel by the pressure of the clip member.

3,814,081

OPTICAL MEASURING CATHETER

Toshiyuki Mori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1972, Ser. No. 239,693
Claims priority, application Japan, Apr. 2, 1971, 46-24593; Apr. 2, 1971, 46-24594; Apr. 2, 1971, 46-24595; Apr. 2, 1971, 46-24597; May 10, 1971, 46-37204
Int. Cl. A61b 5/02
U.S. Cl. 128—2 L 2 Claims



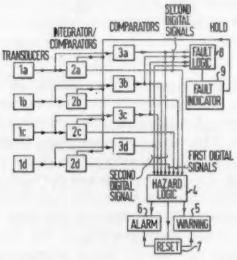
Optical measuring catheter for measuring the degree of oxygen saturation in the blood of a living body utilizing an illuminating fiber optical system and a light receiving fiber optical system arranged closely along each other the forward ends of which are adapted to be inserted together into an organ of the living body in which the blood is flowing. By supplying light having a wave length of about 600 – 750 mz or light having a wave length of about 800 mz to the illuminating fiber optical system, the degree of oxygen saturation in the blood is determined by the light incident to the blood and reflected thereby so as to be received by the light receiving fiber optical system due to the fact that the absorption spectrum of Hb is different from that of HbO2 The optical measuring catheter comprises an optical member attached to the forward ends of the fiber optical systems for preventing the forward ends from directly contacting the inner wall of the organ into which the forward ends are inserted while insuring the optical communication of the forward ends with the exterior of the optical member.

3,814,082

PATIENT MONITORING SYSTEMS

David Ernest Meguyer Taylor, Edinburgh, Scotland, assignor to National Research Development Corporation, London, England

Filed Mar. 17, 1972, Ser. No. 235,547
Claims priority, application Great Britain, Mar. 18, 1971, 7202/71
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 R 7 Claims



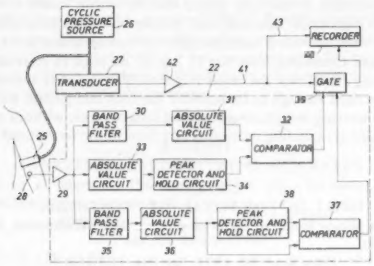
A patient monitoring system is provided in which signals are obtained from transducers to represent parameters of the patient's condition and these signals are integrated with a time-loading and then compared with reference levels to provide digital signals indicating whether the integrated signals exceed

the reference levels or not. Predetermined combinations of the digital signals denote patient conditions requiring attention and such combinations are recognised by logic to generate warning or alarm signals. Any one transducer can be associated with both relatively short and long time constant integration with the short and long term integrated signals being separately compared with respective references. Furthermore, such short and long term integrated signals can be differenced and compared with a further reference. It may also be appropriate to compare the transducer signals directly with yet further references. All such comparison can provide digital signals relevant to indicating patient's condition, and all such comparisons can be made with both high and low level references.

3,814,083
APPARATUS AND METHOD FOR PROCESSING KOROTKOV SOUNDS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Donald P. Golden, League City; George W. Hoffler, and Roger A. Wolthuis, both of Seabrook, all of Tex.

Filed May 24, 1972, Ser. No. 256,317
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 A **3 Claims**



A Korotkov sound processor is disclosed which is used in a non-invasive, automatic blood pressure measuring system wherein the brachial artery is occluded by an inflatable cuff. The Korotkoff sound associated with the systolic event is determined when the ratio of the absolute value of a voltage signal representing Korotkov sounds in the range of 18–26 Hz to a maximum absolute peak value of the unfiltered signals first equals or exceeds a value of 0.45. The Korotkov sound associated with the diastolic event is determined when a ratio of the voltage signal of the Korotkov sounds in the range of 40 to 60 Hz to the absolute peak value of such signals within a single measurement cycle first falls below a value of 0.17. The processor signals the occurrence of the systolic and diastolic events and these signals can be used to control a recorder to record pressure values for these events.

3,814,084
THERAPUETIC DEVICE

August W. Gustafson, 350 Pasadena Pl., Corpus Christi, Tex. 78411

Filed May 4, 1973, Ser. No. 357,183
Int. Cl. A61h *1/02*
U.S. Cl. 128—25 R **5 Claims**

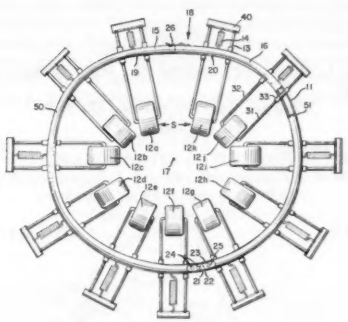
An apparatus adapted for exercising the arms of a patient recovering from a mastectomy or one having bursitis or the like combines a pulley, a cord disposed over a pulley and having two freely swinging ends, a handle carried by the cord on each side of the pulley and spaced longitudinally from each other a distance which permits one arm of a standing patient to be upright in a plane substantially parallel to the longitudinal axis of the patient's body while the other arm depends from the shoulder along the side of the body also in a plane which is substantially parallel to the longitudinal axis of the body when the patient is grasping both handles but less than

the vertical distance between the patient's hands when the arms are so disposed, and a U-shaped bracket adapted to fit over the top edge of a door and carrying an outwardly and upwardly projecting pole to which the pulley is attached.

3,814,085
MASSAGING DEVICE

Edward C. Kupchinski, 424 S. Burlington Ave., Los Angeles, Calif. 90057

Filed Nov. 24, 1972, Ser. No. 309,440
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **13 Claims**



A body massager including a frame which extends about a user's body and is movable upwardly and downwardly relative thereto, and carries a series of circularly spaced rollers for contacting and massaging the body, with the rollers being spring urged inwardly against the body to follow its contours.

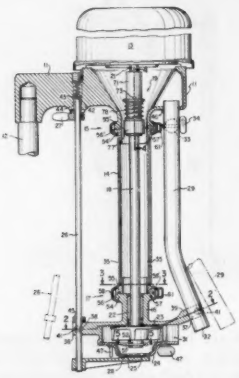
3,814,086
HYDROTHERAPY AGITATOR WITH PROVISION FOR RAPID DISASSEMBLY AND REASSEMBLY

John Lemb, Montoursville, Pa., assignor to Ile Electric Corp., Williamsport, Pa.

Filed May 17, 1973, Ser. No. 361,136
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **8 Claims**

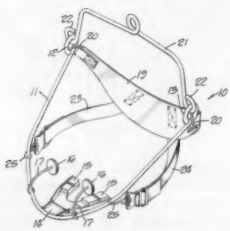
A hydrotherapy agitator having a suspension bracket and a motor mounted thereon, a downwardly extending support tube with an impeller housing attached at the bottom thereof,

a drive shaft within the support tube connecting the motor shaft with an impeller in the housing, an apertured bottom plate for the housing, and and air tube and a water control rod mounted respectively between the suspension bracket and im-



peller housing, is provided with means for rapidly disassembling and reassembling the parts normally immersed during use, so that effective sterilization of internal as well as external surfaces of the parts is facilitated.

3,814,087
CERVICAL HARNESS
Norman L. Heikes, 917 Carrillo Rd., Santa Barbara, Calif. 93103
Filed Jan. 26, 1973, Ser. No. 326,963
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **5 Claims**

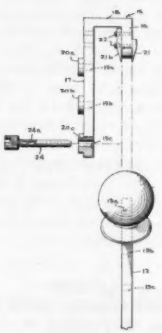


A head halter or cervical harness employs a rigid U-shaped member which extends from in front of the mouth to locations over the ears of the user. A mouthpiece fixed to the rigid member extends into the mouth and contacts the rear molars or, in the absence of teeth, the posterior portion of the upper mandible. Spaced pads fixed on the rigid member contact outer surfaces of the cheeks. A flexible sling extends between the ends of the rigid member and under the rear portion of the head, and a bail applies vertical force to the ends of the rigid member and the ends of the sling. Side straps hold the sling against displacement.

3,814,088
ORTHOPEDIC BOOT
Edward A. Raymond, 180 E. Hartsdale Ave., Hartsdale, N.Y. 10530
Filed Jan. 12, 1972, Ser. No. 217,217
Int. Cl. A61f *5/04*
U.S. Cl. 128—87 R **4 Claims**

A snugly fitting orthopedic boot having a rigid sole wherein the sole plate is part of a unitary frame along with side splints for the leg extending upwardly from the sole plate. The junction of each side splint with the sole plate is sufficiently long to render the side splints substantially inflexible in the longitudinal direction of the sole plate, and the entire frame is encased in a generally conventional leather boot structure which is preferably provided with an open toe construction and lacing means extending from toe to top of the boot to provide a very snug fit. When the boot is properly laced, the internal frame is rigid enough to immobilize the foot and permit walking and bearing weight on an injured foot or ankle without any significant articulating motion of any joint of the foot or ankle.

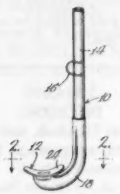
3,814,089
DRILL JIG FOR TOTAL HIP PROSTHESIS
William Minor Deyerle, 2222 Monument Ave., Richmond, Va. 23220
Filed Sept. 24, 1971, Ser. No. 183,418
Int. Cl. A61f *5/04*, *1/24*; A61b *17/18*
U.S. Cl. 128—92 EB **5 Claims**



A fixation of the femoral prosthesis member in the femur in performing hip prosthesis surgery, and the jig structure used in performing such fixation, wherein a jig comprising an elongated leg member having plural drill guide holes is releasably secured to the shank of the prosthesis member so that the drill guide holes aline precisely with fastener openings in the prosthesis shank. When the assembled prosthesis member and jig are in proper position relative to the femur, a drill bit is passed through the jig holes to drill holes through the cortex of

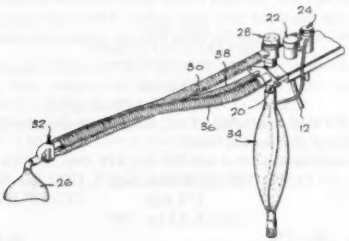
the femur to receive fixation fasteners. An additional guide sleeve may be passed through such holes to guide a smaller drill bit for drilling holes in the femur beyond the prosthesis shank.

3,814,090
MOUTHPIECE FOR A SNORKEL
James E. Hill, Bremerton, Wash., assignor to Imperial Manufacturing Co., Bremerton, Wash.
Filed July 25, 1972, Ser. No. 274,963
Int. Cl. A63b *7/00*
U.S. Cl. 128—145 A **2 Claims**



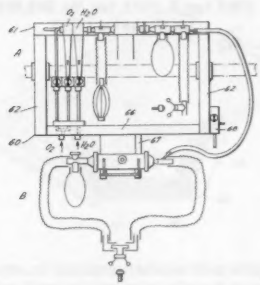
An improved mouthpiece for a snorkel wherein the mouthpiece comprises a curved flap of flexible material having an arc length of 3½ to 4¼ inches and has a smooth concave surface so that the same may be retained in the mouth of a diver without necessity of the diver exerting a gripping force on the mouthpiece with his teeth.

3,814,091
ANESTHESIA REBREATHING APPARATUS
Melvyn L. Henkin, 19640 Greenfriar Dr., Tarzana, Calif. 91356
Filed Jan. 17, 1972, Ser. No. 218,337
Int. Cl. A61m *17/00*
U.S. Cl. 128—188 **45 Claims**



A general anesthesia rebreathing system comprised of a disposable portion easily coupled to and decoupled from a permanent portion. The disposable portion includes conventional breathing tubing for coupling a source of fresh gas, as from an anesthesia machine, to a patient and in addition an overflow tube for coupling the patient end of the system to an overflow (pop-off) valve, preferably mounted on the machine and constituting part of the permanent portion. The overflow tube entrance is located close to the patient end of the system and in communication with the tubing which conveys expired gas to a reservoir, such as a conventional breathing bag, mounted at the machine end. The arrangement assures that the patient's initially expired dead space gas is conveyed by the tubing to the reservoir with subsequently expired alveolar gas being exhausted through the overflow tube and pop-off valve.

3,814,092
RESPIRATORY REANIMATION AND ANAESTHESIA APPARATUS
Radu Simionescu; Alexandru-Ioan-Bogdan I. Manof, and Constantin T. Nita, all of Bucharest, Romania, assignors to Industria Tehnico-Medicala, Bucharest, Romania
Filed Apr. 6, 1972, Ser. No. 241,559
Claims priority, application Romania, Apr. 15, 1971, 66588
Int. Cl. A61m *17/00*
U.S. Cl. 128—188 **6 Claims**



A portable, multipurpose apparatus for anaesthesia and respiratory reanimation provided with means, for the vaporization of anaesthetic liquids and for the administration of anaesthetics and respiratory reanimation. The assembly comprises T-pieces, with a switch, for the connecting of a self-inflating bag or of a respiratory bellows ahead of the vaporizer and for connection of a respiratory bag, downstream the vaporizer; a third shutting-off T-piece, with a switch is provided with a self-occluding valve or with a soda lime canister and a self-occluding valve, united by corrugated tubes, with connections for a closed-circuit respirator bag or for a respirator for closed circuit. The portable apparatus has the pieces of the assembly and of the first administering circuit mounted on the upper cross-bar of a supporting frame for the table; in a wall version, with a lower support for the new circuit, the frame can be fixed detachably to a bar fastened in the wall.

3,814,093
CONTROLLED, MISTED OXYGEN DISPENSER
Warren B. Gregory, P.O. Box 184, Hurtsboro, Ala. 36860
Filed Sept. 10, 1971, Ser. No. 179,411
Int. Cl. A61m *15/00*
U.S. Cl. 128—210 **5 Claims**

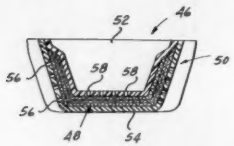
The inflow rate of oxygen gas to a face mask is controlled by the speed of a motor driving a rotating metering device through which the oxygen is conducted. A valve regulated

flow of liquid is introduced into the oxygen flow stream for baffled mixing therewith prior to entering the face mask. Exhalation outflow from the face mask is synchronized with the oxygen inflow by the metering device.

3,814,094
LOW PROFILE COLD WEATHER RESPIRATOR

Armand De Angelis, Southbridge, Mass., and Albert J. Laliberte, South Woodstock, Conn., assignors to Omnitech Inc., Southbridge, Mass.

Filed Apr. 3, 1972, Ser. No. 240,591
Int. Cl. A61m *15/00*
U.S. Cl. 128—212 **4 Claims**

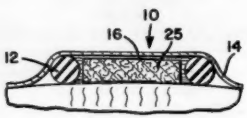


A low profile cold weather respirator in which a body of heat conductive foraminous material adapted to be supported over either the nose or mouth or both of the wearer is encased in an envelope adapted to be held on the wearer's head by a strap or the like and is adapted to form a seal with the wearer's face so that inhaled air is drawn into the cup through the envelope and into heat exchange relationship with the heat conductive material as it enters the space enclosed by the respirator and so that exhaled breath passes outwardly through the heat conductive material.

3,814,095
OCCLUSIVELY APPLIED ANESTHETIC PATCH

Herman Michael Lubens, 396 Elm Grove Dr., Dayton, Ohio 45415

Filed Mar. 24, 1972, Ser. No. 237,712
Int. Cl. A61m *19/00*; **A61f** *7/02*
U.S. Cl. 128—260 **7 Claims**



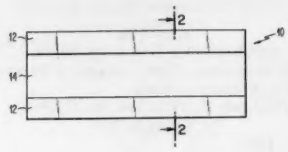
An adhesively applied patch for topical application to intact skin for producing effective anesthesia for varying amounts of time depending upon the extent of time the patch is applied. The patch includes an occlusive member mounted on an adhesive backing, the topical anesthetic agent being on a gauze-like pad received within the occlusive member such that penetration of the anesthetic agent into intact skin is enhanced. The anesthetic agent is preferably the amino-acyl amide type and virtually nonallergenic. Typical uses of such a patch are intradermal allergen skin testing, lunbar punctures, skin biopsies and minor surgical procedures.

3,814,096
FACIAL TISSUE

Felicia R. Weiss, and Harry M. Weiss, both of 14 Meadow View Dr., Poughkeepsie, N.Y. 12603

Filed Mar. 9, 1973, Ser. No. 339,851
Int. Cl. A61f *13/00*; **A61m** *35/00*
U.S. Cl. 128—260 **19 Claims**

This is an improved facial type of tissue which contains both a dry area to serve as a means for cleaning or drying wet or watery portions of the nose, mouth, sweating face or other parts of the body and a lubricated area to serve as a means for applying a soothing or medicated coating to portions of the

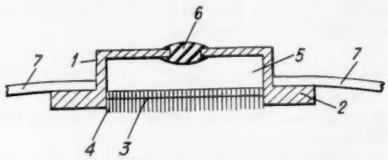


face or body that are either irritated or might become irritated because of either repeated wiping or contact with dry tissues or exposure to wind or sun.

3,814,097
DRESSING

David Ganderton; James McAinsh, and Gordon Varney, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 24, 1973, Ser. No. 326,474
Claims priority, application Great Britain, Feb. 14, 1972, 006692/72
Int. Cl. A61f *7/02*
U.S. Cl. 128—268 **10 Claims**

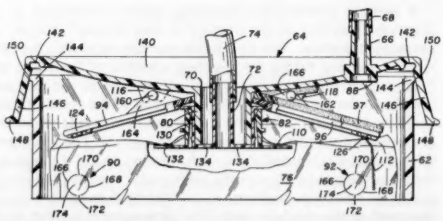


A dressing for administering a drug through the skin of a host comprising a reservoir for the drug and, located between the reservoir and the skin of the host when the dressing is in use, a pad provided with tiny spikes. These tiny spikes augment the absorption of the drug without causing irritation.

3,814,098
MEDICAL SUCTION APPARATUS

David W. Deaton, Dallas, Tex., assignor to Deaton Medical Company, Burns Flat, Okla.

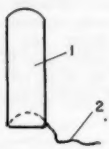
Continuation-in-part of Ser. No. 206,018, Dec. 8, 1971, Pat. No. 3,745,999. This application Aug. 9, 1972, Ser. No. 279,063
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **34 Claims**



The specification discloses medical suction apparatus including a generally rigid container having a lid which supports a flexible drainage sack within the container. A pair of con-

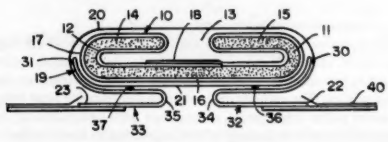
duits extend from the container for connection to a patient area to be drained and for connection to a source of vacuum. In operation, fluid is drawn from the area to be drained and collected within the drainage sack. A plurality of apertures are formed through the side walls of the sack in order that the pressure is equalized on both sides of the sack to prevent the sack from becoming closed during suction operation. After the sack is filled with liquid, levers are actuated to disengage the sack from the lid and the sack is disposed of. The sack is double lined and in the preferred embodiment includes apertures therethrough that vary in size according to the amount of vacuum applied to the apparatus.

3,814,099
TAMPONS
Paul Kobler, 81 Fenimore St., Lynbrook, N.Y. 11563
Filed Sept. 20, 1972, Ser. No. 290,732
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **2 Claims**



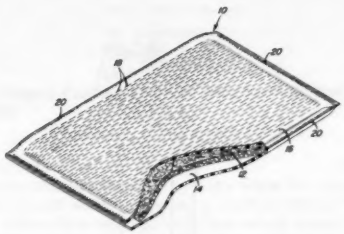
A catamenial tampon provided with a withdrawal cord and a moisture repellent foil, said foil lined inside with a smoothly gliding material, the wrapping of the tampon held together by a band or similar means or by pushing the tampon partly through a hole in the packing material.

3,814,100
DISPOSABLE DIAPER
Ernst Daniel Nystrand, and Brian H. McIntosh, both of Green Bay, Wis., assignors to Paper Converting Machine Co., Inc., Green Bay, Wis.
Continuation-in-part of Ser. No. 32,560, April 28, 1970, Pat. No. 3,667,468. This application Mar. 1, 1972, Ser. No. 230,644
Int. Cl. A41b *13/02*
U.S. Cl. 128—287 **8 Claims**



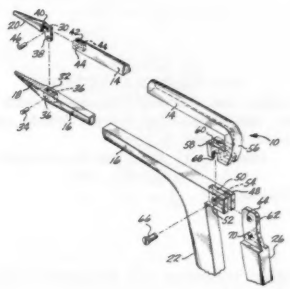
A disposable diaper having a C-folded pad within a wrapping envelope, the envelope being substantially wider than the C-folded pad to provide side flaps adapted to initially underlie the pad and be selectively folded outwardly for securing the pad in place, the C-fold providing a lined channel on one side of the pad which encourages more even, rapid, and complete dispersion of body fluid.

3,814,101
DISPOSABLE ABSORBENT ARTICLES
Theodore Fredrick Kozak, Peekskill, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 73,185, Sept. 17, 1970, abandoned. This application Dec. 4, 1972, Ser. No. 312,131
Int. Cl. A41b *13/02*
U.S. Cl. 128—287 **59 Claims**



Disposable absorbent articles are disclosed which include a topsheet of non-fibrous hydrophobic film having a plurality of valvular openings therein and a system of depressed areas disposed across the surface of the topsheet. The openings readily permit flow of liquid in the direction of the absorbent but substantially reduce the possibility of flow in the opposite direction.

3,814,102
SURGICAL INSTRUMENT
Ben Thal, 10602 Friar Tuck Ln., Edmonds, Wash. 98020
Filed Oct. 12, 1972, Ser. No. 296,796
Int. Cl. A61b *17/28, 17/12*
U.S. Cl. 128—321 **11 Claims**



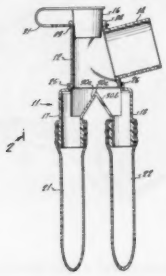
A surgical instrument commonly referred to as an alligator forceps includes a pair of jaws operably connected to a pair of handles by a longitudinally split shank. The lower jaw is rigidly connected to the lower portion of the split shank. The upper jaw is pivotally connected to the forward ends of both the upper and lower shank portions so that the jaws can be opened and closed by longitudinal movement of the shank portions with respect to each other. A forward handle is rigidly connected to the lower shank portion. A flange, connected to the rear of the upper shank portion, extends downwardly to a point below the lower shank portion. A rearward handle is pivotally connected to the lower shank portion and is connected to the flange at a point below the connection to the lower shank to move the flange forwardly and rearwardly. Thus forward and rearward movement of the rearward handle opens and closes the jaws without longitudinal or angular movement of the jaws with respect to the forward handle.

3,814,103

BINASAL PHARYNGEAL AIRWAY

Bruce E. Fettel, Diamond Bar, and Samuel Burd, Long Beach, both of Calif., assignors to Shiley Laboratories, Inc., Santa Ana, Calif.

Filed Mar. 8, 1973, Ser. No. 339,098
Int. Cl. A61m *31/00*
U.S. Cl. 128—351 **15 Claims**



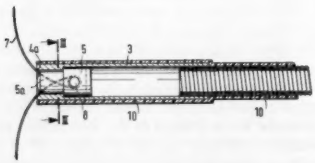
A binasal pharyngeal airway is provided for administering anesthetic which includes a tube connector having hollow legs for connection of pharyngeal tubes, and a hollow swivel body with a swivel connection to said tube connector, having a suction hole opposite the connection to the tube connector for receiving a suction catheter within either of said tube connector hollow legs and having a side opening to receive a snap fitting for connection to an anesthetic line. The airway may be manufactured inexpensively and as a consequence may be disposed of after a one-time use.

3,814,104

PACEMAKER-ELECTRODE

Werner Irnich, and Gerhard Rosenbauer, both of Aachen, Germany, assignors to Dr. Werner Irnich, Aachen, Germany, a part interest

Filed Aug. 21, 1972, Ser. No. 282,030
Int. Cl. A61n *1/04*
U.S. Cl. 128—418 **2 Claims**



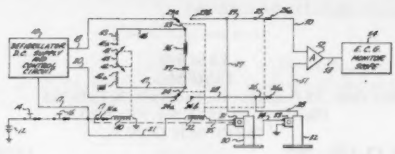
A transvenous unipolar electrode for permanent pacing of the heart with protruding wire hooks to fix it to the myocardium with an electrode tip comprising a hollow cylinder, in which a bolt, bearing the wire hooks is movable with the aid of a stylet within the hollow electrode from one end position, in which the wire hooks are completely lying within the hollow cylinder, to a second end position, in which the wire hooks are outside the cylinder in the working position.

3,814,105

PORTABLE DEFIBRILLATORS INCLUDING ROTARY SOLENOID RELAYS FOR ENERGY TRANSFER AND DUMPING

Jack D. Howard, Seattle; Stanley V. Seiffert, Snohomish, and Christopher R. Wartes, Lynnwood, all of Wash., assignors to Physio-Control Corporation, Seattle, Wash.

Filed Mar. 1, 1972, Ser. No. 230,618
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 D **4 Claims**



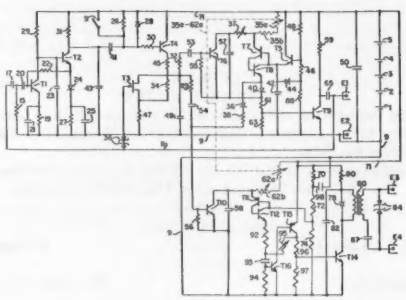
A portable defibrillator including at least one open-frame relay is disclosed. The relay combines the functions of previously-used transfer, dump, and ECG protection relays required in portable defibrillator-ECG monitor units. The relay includes at least one rotary solenoid for providing reliable operation while yet resisting accidental operation due to physical shock or the like.

3,814,106

ATRIAL AND VENTRICULAR PACER HAVING INDEPENDENT RATE CONTROLS AND MEANS TO MAINTAIN A CONSTANT AV DELAY

Barouh V. Berkovits, Newton Highlands, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 14, 1972, Ser. No. 244,156
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **4 Claims**

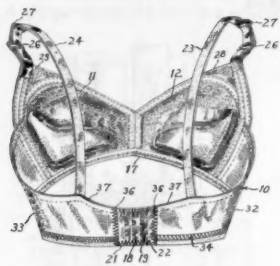


There is disclosed an atrial and ventricular pacer having independent rate and AV delay controls. An adjustable timing circuit is provided to control the rate of the ventricular stimulating pulses. The occurrence of each ventricular beat triggers an atrial pulse generating circuit, an atrial stimulating pulse being generated following a variable time interval. The ventricular rate control circuit includes one potentiometer, and the atrial pulse generating circuit includes two potentiometers connected in series, one of which is ganged to the ventricular rate potentiometer. If the impedance of the ventricular rate potentiometer is increased to increase the ventricular escape interval, then as a result of the ganging of the two potentiometers the atrial pulse delay is similarly increased; thus the AV delay remains constant even as the pacer rate is varied. The second potentiometer in the atrial pulsing circuit is used to vary the AV delay.

3,814,107
BRASSIERE

Irwin Greenblatt, and Nicholas A. Marino, both of Blauvelt, N.Y., assignors to Sears Roebuck and Co., Chicago, Ill.

Filed Oct. 31, 1972, Ser. No. 302,553
Int. Cl. A41c *3/00, 3/10*
U.S. Cl. 128—480 **10 Claims**



A padded type brassiere has a pair of padded bust-supporting cups, a longitudinally resilient under-bust, body encircling band, a pair of resilient shoulder straps secured to the outer side-portion of the bust cups, and a pair of resilient gussets secured to the upper outer quadrants of the bust cups and the adjacent shoulder straps. The gussets flex in response to tension applied to the shoulder straps to maintain the bust cups in a relatively fixed position in relation to the under-bust band. The bust cups have a pad of soft fibrous material integral therewith, each forming a shelf along a generally diagonal line of the cup to push the bust of the wearer upwardly and inwardly of its normal unsupported position.

3,814,108
TOBACCO SUBSTITUTE

Willis A. Fairchild, 273 W. Broadway, Shelbyville, Ind. 46176

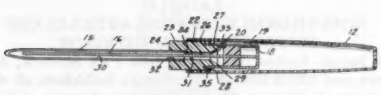
Filed Jan. 3, 1972, Ser. No. 215,072
Int. Cl. A24b *15/00*
U.S. Cl. 131—2 **1 Claim**

A composition for smoking or chewing which contains little or no nicotine or tars and which is substantially comprised of plants from the genus Gnaphalium.

3,814,109
PIPE TOOL

Edward Donald Patton, 611 E. 88th St., Chicago, Ill. 60619

Filed Nov. 24, 1972, Ser. No. 309,427
Int. Cl. A24f *9/08*
U.S. Cl. 131—243 **10 Claims**



A pipe tool adapted for carrying in a pocket and provided with a knife blade for scraping a pipe bowl, a pick for cleaning a stem of a pipe, and a tamping surface for tamping tobacco into a pipe bowl. The pick is telescopically received in a hollow blade of the tool and covered by a cup providing the tamping surface and the tool further includes a pair of cap portions for completely enclosing the knife blade and cup providing the tamping surface to prevent harm to a person carrying the tool and soiling of the persons clothes. The blade is mounted within a passageway extending through a hollow supporting member and the pick extends into the hollow portion of the blade through the same. The pick has a base member secured within a cup member serving as a handle therefor and having a flat tamping surface at its closed end. When the pick is placed in the blade, the open end of the cup member is supported in an annular groove in an end surface of the supporting member. The caps are mounted in abutting relation on the exterior of the supporting member and extend in opposite directions therefrom.

3,814,110
HAIR TREATMENTS

Harry Eugene Cassidy, 2310 Gall Ave., North St. Paul, Minn. 55109

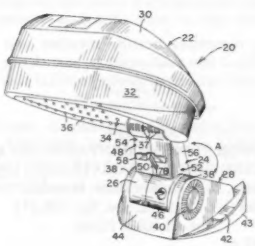
Filed Oct. 4, 1971, Ser. No. 186,450
Int. Cl. A45d *7/00*
U.S. Cl. 132—7 **5 Claims**

Freshly shampooed hair dries faster when the shampoo is rinsed out with water containing a small amount of wetting agent, preferably a nonionic surfactant, which lowers the surface tension of the water. The effect is enhanced if the wetting agent is also included in either the water used to pre-wet the hair before applying the shampoo or in the shampoo itself.

3,814,111
PORTABLE HOODED HAIR MOISTURIZER AND DRYER

Edward J. Doyle, Hatboro, and Nial C. Bartram, Lancaster, both of Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed Dec. 26, 1972, Ser. No. 317,925
Int. Cl. A45d *1/00*
U.S. Cl. 132—9 **9 Claims**



A portable combination hair moisturizer and dryer which includes a base, a head supporting assembly, and a rigid head assembly. Most of the base, and the head mounting assembly nest in the head assembly. A steam-generator drawer is positioned in the head mounting assembly and is thus secured and protected within the nested enclosure during carrying and during storage.

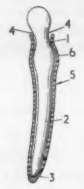
3,814,112
GROOMING IMPLEMENTS

Earl Silas Tupper, Nassau, Bahamas, assignor to Tup! (Panama) S.A., Panama City, Panama

Filed July 26, 1972, Ser. No. 275,410
Claims priority, application Great Britain, July 30, 1971, 36075/71
Int. Cl. A45d *24/00*
U.S. Cl. 132—11 R **3 Claims**

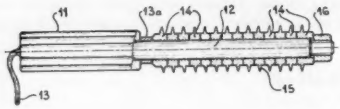
A hair pick has smooth teeth of rounded transverse cross-section lying in a common arcuate plane, which taken

together define no constrictions between themselves or with the integral back, which latter can possess one or more



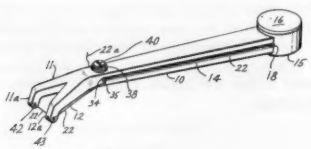
smooth transverse grooves so as to fit securely within a complementarily shaped carrying case.

3,814,113
CURLING IRON
Bruno P. Morane, Paris, and Andre Vien, Villeneuve le Roi, both of France, assignors to L'Oreal, Paris, France
Filed May 31, 1972, Ser. No. 258,357
Claims priority, application France, June 14, 1971, 71.21501
Int. Cl. A45d *2/36*
U.S. Cl. 132—36 R **3 Claims**



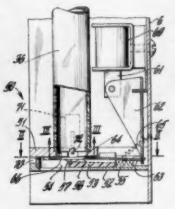
Curling iron comprises heating member and a flexible sleeve loosely fitted into said member, said sleeve being provided with external, radially projecting conical pins.

3,814,114
APPARATUS FOR STORING DENTAL FLOSS AND FOR HOLDING DENTAL FLOSS DURING USE
Edward J. Roberts, 2630 Hollow Hook, Houston, Tex. 77055
Filed Oct. 17, 1972, Ser. No. 298,271
Int. Cl. A61c *15/00*
U.S. Cl. 132—92 A **4 Claims**



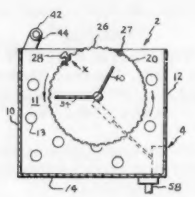
Apparatus for storing dental floss and for holding dental floss during use. The dental floss is stored in a cassette from which it is withdrawn for use. In use, dental floss is held across the mouth of a yoke, and the dental floss after use is replaced by a fresh length of dental floss withdrawn from the cassette. The yoke is inserted into the mouth to apply the dental floss to the teeth.

3,814,115
COIN DISPENSING APPARATUS
Joseph Edward Van Acker, Pleasantville Rd., New Vernon, N.J. 07976
Filed Feb. 20, 1973, Ser. No. 333,546
Claims priority, application Great Britain, Feb. 23, 1972, 8386/72
Int. Cl. G07d *1/02*
U.S. Cl. 133—4 **8 Claims**



A coin dispenser for use in coin operated apparatus is described in which coins can be controllably dispensed one at a time from a coin stack in a coin tube and, alternatively, the entire contents of the coin tube can be readily discharged.

3,814,116
PERMANENT WAVE HAIR ROLLER WASHER
Verna S. Bell, 6707 Concord Hill, Louisville, Ky. 40728
Filed Nov. 7, 1972, Ser. No. 304,403
Int. Cl. B08b *3/06*
U.S. Cl. 134—104 **3 Claims**

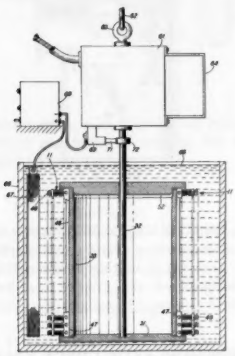


A rotary tumbling device is used to wash and separate hair rollers from permanent wave papers. The papers are removed from the tumbling device by fluid jets and are collected on a fixed shelf.

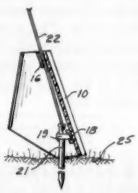
3,814,117
NONUNIFORMLY TREATING ARTICLES AND SUPPORTING THEM THEREFOR
John Joseph Rackus, Whitehall; John Paul Skilbeck, Allentown, and Alfons Henryk Szkudlapski, Bethlehem, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.
Continuation-in-part of Ser. No. 263,897, June 19, 1972, abandoned, which is a division of Ser. No. 100,176, Dec. 21, 1970, Pat. No. 3,692,638. This application July 17, 1972, Ser. No. 272,539
Int. Cl. B08b *3/08, 11/02*
U.S. Cl. 134—158 **4 Claims**

In making transistors using lead frames, improved bonds and savings in gold result from plating gold more heavily and in controlled amounts at the ends of the lead frames where wire and semiconductive chip bonds are to be made. To accomplish such nonuniform plating, the lead frames are arranged in a spaced, radial, fan-like manner about an axis to

form a cylindrical configuration of the frames. The ends of the frames where bonds are to be made are on the outer periphery of the configuration. The carrier strips, which are located opposite such ends and which are eventually trimmed away, are on the internal portion of the configuration and may be partially masked to reduce gold plating on such strips. A cathode is connected to the lead frames, which are then immersed in a plating bath and revolved about the axis of the frames and within a hollow cylindrical anode spaced midway between two flat anodes. A sparger pumps the bath in a direction substantially perpendicular to the axis of the frames. The frames and cylindrical anode are positioned midway between the top surface of the bath and the bottom of a tank holding the bath. With this arrangement the frames are nonuniformly plated, with more gold being plated on the ends where bonds are to be made than on the carrier strips. Also, each group of three leads of each frame for a single transistor is plated substantially alike. This arrangement of the frames and rotation of them in the bath also results in the plating of a large number of frames using a minimum volume of a tank holding the bath. An increase in plating rates is also achieved.



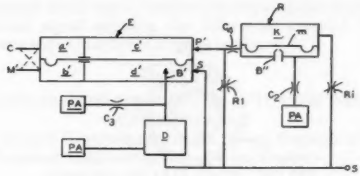
3,814,118
TENT STAKE GUARD
Timothy William Larson, 411½ W. Main, Freeport, Ill. 61032
Filed Oct. 3, 1972, Ser. No. 294,683
Int. Cl. A45f *1/16*
U.S. Cl. 135—15 PE **6 Claims**



A hollow, conically shaped plate which fastens about the stake and stake rope anchor section of a camper tent, so as to prevent both children and adults from injury caused by their walking inadvertently into, or tripping over, the tent stake. The unit may be fabricated of a plastic sheet or molding which is impregnated, or painted over, with fluorescent material.

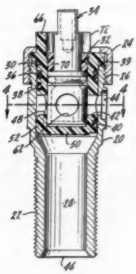
The device is in the general form of a slotted hollow conical section, with the slot permitting the device to be passed over the stake rope, when fastening to a tent stake. Means are provided for fastening an inside surface of the device to the tent stake, and the corresponding outer surface of the device is recessed to permit the stacking of several of these units, when stored.

3,814,119
PNEUMATIC CONTROLLERS
Pierre Bertrand, Jouy-en-Josas, and Maurice Nony, Billere, both of France, assignors to Computeurs Schlumberger, Montrouge, France
Filed July 10, 1972, Ser. No. 270,120
Claims priority, application France, July 12, 1971, 71.25472
Int. Cl. F15b *5/00*
U.S. Cl. 137—86 **3 Claims**



A pneumatic controller providing an outgoing signal proportional to the magnitude and time integral of the incoming signal comprises a first sealed-beam balance with a rigid beam attached onto a diaphragm defining four chambers, a second sealed-beam balance with two chambers performing the flow relay function, and a pressure balance with two chambers for copying the integral pressure. In the case of a pneumatic controller providing an outgoing signal proportional to the magnitude, time integral and time derivative of the incoming signal, the first sealed-beam balance is preceded by a time derivative stage comprised of a sealed-beam balance with four chambers similar in construction to the first sealed-beam balance.

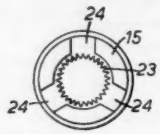
3,814,120
PLUG VALVE
Alfred M. Moen, 25 Lakeview Dr., Grafton, Ohio 44044
Filed Mar. 26, 1973, Ser. No. 344,506
Int. Cl. F16k *3/02*
U.S. Cl. 137—242 **22 Claims**



An on-off fluid valve utilizes a rotatable stem positioned within a fixed sleeve. The stem has a passage extending through it which can be placed into register with the sleeve inlet and outlet. The stem includes a blade portion and a flexible seal member surrounding the blade portion. The seal

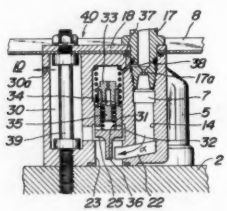
member is sufficiently loosely held on the blade portion of the stem such that fluid pressure at the sleeve inlet provides sealing pressure by the seal member against the sleeve outlet.

3,814,121
FLUID CONTROL VALVES
Thomas Gordon Lawson, Birmingham, England, assignor to Girling Limited, Birmingham, England
Filed Nov. 29, 1971, Ser. No. 202,915
Claims priority, application Great Britain, Dec. 18, 1970, 60218/71; June 11, 1971, 27486/71
Int. Cl. F16k *1/12*
U.S. Cl. 137—329.03 **7 Claims**



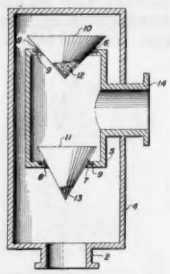
A control valve, for example a pressure reducer valve, has a valve closure member which cooperates with an annular valve seat to seal off a fluid flowpath between the valve closure member and a surrounding annular support member. The support member may have a plurality of inward radial projections and preferably the valve seal has a frusto-conical face for engagement with a sharp-cornered edge of the valve closure member.

3,814,122
DEVICE FOR PREVENTING FOAMING OF OIL
Seiji Akaike, Aikawa-Machi, Japan, assignor to Atsugi Motor Parts Co., Ltd., Atsugi City, Japan
Filed Nov. 10, 1972, Ser. No. 305,584
Claims priority, application Japan, Apr. 26, 1972, 47-49296[U]
Int. Cl. G05d *16/00*
U.S. Cl. 137—490 **5 Claims**



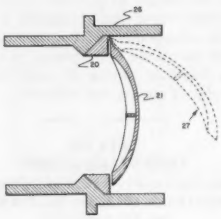
A foam-preventing device for automobile hydraulic power units, comprising an intermediate pressure chamber located between an oil tank of the unit and the outlet of a flow-rate control valve of the unit for by-passing excess oil to the oil tank. Excess oil is forced by this arrangement to flow through the intermediate chamber so as to avoid a sudden pressure change and foaming thereof.

3,814,123
PRESSURE RELIEF VENT
Christie K. Cook, Box 201, Manvel, Tex. 77578
Filed May 22, 1972, Ser. No. 255,434
Int. Cl. F16k *45/00*
U.S. Cl. 137—493.9 **1 Claim**



A tank vent for relieving both pressure and vacuum in tanks, vessels and the like, having self aligning valves and novel seals for leak proof seating of the operating members after each opening.

3,814,124
THERMOPLASTIC CHECK VALVE
Richard W. Bell, Brossard, Quebec, Canada, assignor to Esso Research and Engineering Company, Linden, N.J.
Filed Sept. 20, 1972, Ser. No. 290,652
Int. Cl. F16k *15/03, 15/16*
U.S. Cl. 137—525.3 **4 Claims**

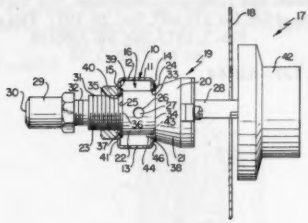


A valve element is provided for converting a section of plastic pipe, particularly increaser bushings and cleanout T's, into an effective check valve. The valve element has a ring, cover and flexible web integral with the cover. The outside diameter of the ring is sufficient to permit a snug fit of the ring with the attached coyer in the pipe section thereby converting the pipe section to a check valve.

3,814,125
CONTROL DEVICE HAVING ORIENTING MEANS FOR BEING MOUNTED TO A FUEL SUPPLY MANIFOLD
Roy C. Demi, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 145,272, May 20, 1971, Pat. No. 3,746,039. This application May 2, 1973, Ser. No. 356,419
Int. Cl. F16k *51/00*
U.S. Cl. 137—561 R **2 Claims**

A manifold defined by an annular wall providing a fuel supply passage in the manifold and having a pair of openings passing therethrough on each side of the manifold. A control device is disposed in the openings so as to have one part thereof on one side of the manifold and another part thereof

projecting out of the opposite side of the manifold with an intermediate part of the control device disposed inside the manifold, the control device having means for conveying fuel

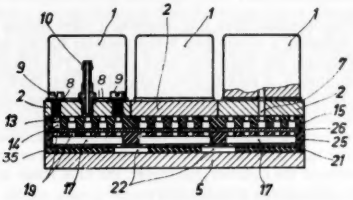


adjacent the intermediate part thereof out through the projecting part thereof and being secured to the manifold in a stacked and sealed relation therewith.

3,814,126
FLUID CONDUCTING SYSTEM

Gerhard Klee, Frankfort, Germany, assignor to Samson Apparatebau AG, Frankfurt/M, Germany

Filed Sept. 5, 1972, Ser. No. 286,240
Claims priority, application Germany, Sept. 15, 1971, 2146041
Int. Cl. F17d *1/00*; **F15c** *5/00*
U.S. Cl. 137—608 **9 Claims**



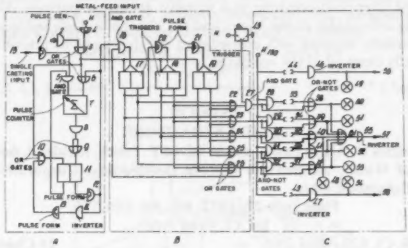
A fluid conducting system having at least three substantially flat, superposable fluid conducting plates and a separating plate between each thereof. The fluid conducting plates and the separating plates are arranged in a stack. Each of the fluid conducting plates has elongated channel means therein arranged in a plurality of parallel columns. The channel means open outwardly on one side. The separating plates are made of a perforatable material and have markings at those locations wherein the longitudinal axes of the elongated channel means cross each other. Thus, a selective perforation of at least one of the separating plates will define a selected fluid conducting system within the stack.

3,814,127
AUTOMATIC DEVICE FOR DISCRETE COMPENSATION OF THE METALLOSTATIC PRESSURE IN MACHINES FOR CASTING WITH GAS PRESSURE

Ivan Dimov Nikolov; Gueorgui Nikolov Rasheev; Ferdo Atanasov Sivov; Nikolai Yonkov Nikolov, and Chavdar Asenov Hristov, all of Sofia, Bulgaria, assignors to Institut Po Metaloznamie I Technologia Na Metalite, Sofia, Bulgaria

Filed Apr. 26, 1972, Ser. No. 247,716
Claims priority, application Bulgaria, Apr. 29, 1971, 17444
Int. Cl. F16k *31/00*
U.S. Cl. 137—624.11 **1 Claim**

An automatic system for discretely adjusting the metallostatic pressure of a metal-casting machine operating under a pressure differential receives an input to its ring counter from the casting unit representing the number of casting cycles. The output of the ring counter is applied to the shift register which,

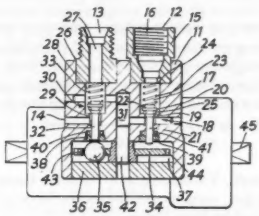


in response to the count, operates an output circuit to provide a control signal adjusting the differential pressure in accordance with a number of castings produced.

3,814,128
VALVE ASSEMBLY HAVING AN ACTUATOR WITH A CAMMING BALL

Max Edward Grantham, Plymouth Devon, England, assignor to Tecalemit (Engineering) Ltd., Devon, England

Filed May 15, 1972, Ser. No. 253,553
Claims priority, application Great Britain, May 17, 1971, 15300/71
Int. Cl. F16k *31/524*
U.S. Cl. 137—624.13 **10 Claims**

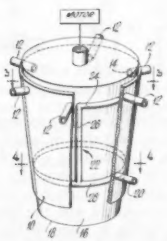


A valve in which the valve member is operable by a tappet means, the tappet means being lifted by a ball which is guided to roll on a plate under the tappet and thereby lift the tappet.

3,814,129
SAMPLING VALVE

Francis J. Cioffi, Somerville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 25, 1972, Ser. No. 292,036
Int. Cl. F16k *11/08*
U.S. Cl. 137—625.11 **6 Claims**



An automatic sampling valve selectively samples fluid from a multiplicity of fluid supply conduits. The supply conduits are

connected to a truncated conical barrel. A compatibly dimensioned plug is contiguously received in said barrel and has a peripheral channel formed thereon. The channel conducts fluid from said conduits to a suitable discharge passage. The plug is rotatable in the barrel and the channel is designed to alternately register with consecutive conduits and to intermittently close all of the conduits.

3,814,130

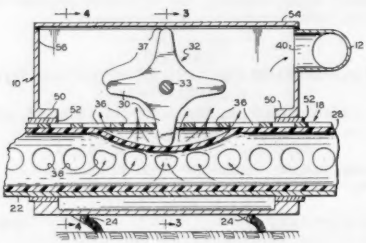
FLUID EXTRACTORS

Charles H. Allen, Pasco, and Willfred F. Smith, Richland, both of Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Filed June 27, 1972, Ser. No. 266,576

Int. Cl. F16k *7/06*

U.S. Cl. 137—625.28 **24 Claims**



Fluid extractors include tubular chambers surrounding and movable along pipes having ports and carrying pressers which project through the ports to press away from the ports adjacent portions of hoses in the pipes to open openings in the hoses for flow of fluid from the hoses into the chambers.

3,814,131

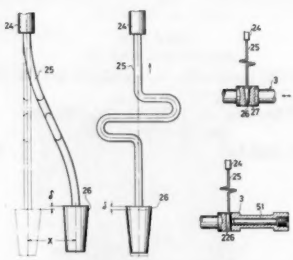
SERVO VALVE

Ikuo Takahashi, Yokohama, and Yasuhiro Hasegawa, Nagoya, both of Japan, assignors to Tokyo Precision Instruments Co., Ltd., Kanagawa-ken, Japan

Filed Nov. 7, 1972, Ser. No. 304,536

Int. Cl. F16k *11/00*

U.S. Cl. 137—625.62 **5 Claims**



The present invention relates to an improved electrically-operated hydraulic servo valve in which a force feedback system is employed in positioning a spool and more particularly to improvements in the connection between the spool and a feedback spring, in which one end of the feedback spring is integrally connected with the spool and at the same time the feedback spring is made to have a flexibility in a direction perpendicular to that of movement of the spool as well in order to accommodate the difference in locus between a circular motion of the feedback spring and a linear motion of the spool.

3,814,132

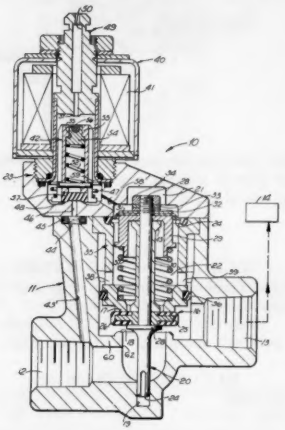
COMBUSTION VALVE AND COMPONENTS THEREOF

Roger Greenwood, Valencia, and Thomas A. Roberts, North Hollywood, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 210,007, Dec. 20, 1971. This application Feb. 7, 1973, Ser. No. 330,220

Int. Cl. F16k *11/10*

U.S. Cl. 137—625.64 **3 Claims**



A pilot operated three-way diaphragm valve having a vent valve including a closed end metal cylinder having an open end to receive the three-way valve exhaust. The cylinder has holes through it. A rubber tube is assembled over the cylinder. The cylinder and tube have an interference fit. The tube seals the cylinder holes shut until the differential pressure across the vent valve to cause venting rises to a predetermined pressure. The tube also has holes which do not lie in registration with those of the cylinder. Moreover, the tube holes are staggered relative to the cylinder holes.

3,814,133

SOLENOID OPERATED COMPRESSED AIR VALVE

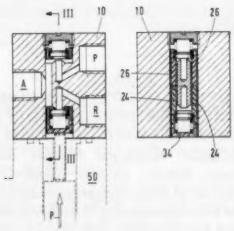
Herbert Veh, Oberuhldingen, Germany, assignor to Elecktroteile GmbH, Bodensee, Germany

Filed Nov. 17, 1972, Ser. No. 307,468

Claims priority, application Germany, Nov. 19, 1971, 2157522

Int. Cl. F16l *11/02*

U.S. Cl. 137—625.65 **6 Claims**



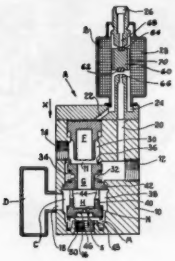
A compressed air valve comprises valve plates which are arranged to be moved by a coaxially arranged solenoid with a plunger. The valve plates are held in valve holders which are connected together by feet which abut against each other and extend in holes in a valve block.

3,814,134

SERVO-OPERATED ELECTROVALVE

Lamberto Vanti, Milan, Italy, assignor to Fiat Societa Per Azioni, Turin, Italy

Filed Oct. 18, 1972, Ser. No. 298,589
Claims priority, application Italy, Oct. 21, 1971, 30140/71
Int. Cl. F16k 31/12
U.S. Cl. 137—627.5 4 Claims



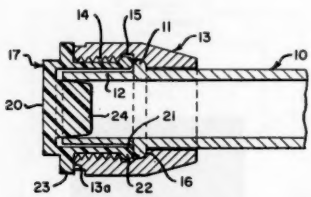
A servo-operated electrovalve includes a plurality of duct controlling pistons and fluid storing capacity means. One of the pistons controlls a fluid discharge duct and has a throttling hole, as well as calibrated spring means urging the piston away from a valve seat of the discharge duct. The valve is able — to carry-out a pre-set pressure time discharge curve, comprising a first sudden pressure drop as obtained during filling the capacity means, a second slow pressure decrease through the throttling hole and a third sudden pressure drop, when the force of the spring means overcomes the action of discharge pressure fluid on the piston and moves the same away from the seat, thus freeing the discharge duct.

3,814,135

HOSE AND TUBING ASSEMBLY CLOSURES

Harry Hetzer, Depew, and Augustine V. Cosentino, Tonawanda, both of N.Y., assignors to GTI Corporation, Pittsburgh, Pa.

Filed Mar. 2, 1972, Ser. No. 231,261
Int. Cl. F16l 55/10
U.S. Cl. 138—89 6 Claims



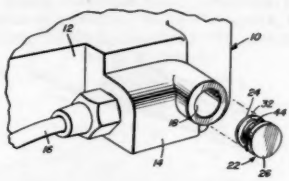
A closure is provided for hose and tubing end assemblies having a shoulder adjacent one end of the hose or tubing and a rotatable nut bearing on said shoulder to provide a seal on installation, which closure is made up of a cylinder of flexible resin open at one end and closed at the other and adapted to be inserted into the threaded portion of the nut and to engage the threads of the nut with an interrupted thread at the open end of the cylinder and to engage the end face of the nut with a radial external flange adjacent the closed end.

3,814,136

PRESSURE SEALING CASTING PLUG

Richard E. Johnson, 2316 53rd Ave. W., Bradenton, Fla. 33507, and Harley D. Johnson, Bradenton, Fla., assignors to said Richard E. Johnson, by said Harley D. Johnson

Filed June 30, 1972, Ser. No. 268,121
Int. Cl. F16l 55/10
U.S. Cl. 138—89 7 Claims



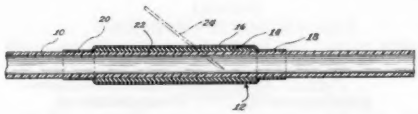
A closure plug for a casting core hole including opposite end portions and an intermediate portion defined therebetween. A first or inner end of the plug is cylindrical and includes a circumferential groove in which sealing O-ring is secured. The second outer end of the plug is also cylindrical for flush seating in the outer end of the associated casting core hole. The intermediate portion of the plug is diametrically reduced and an annular washer constructed of stiff but somewhat resilient material is disposed thereon. The washer includes circumferentially spaced radially outwardly projecting integral resilient fingers inclined slightly toward the second outer end of the plug. The outer extremities of the fingers lie generally on a circular path which is slightly larger in diameter than the fingers, when the closure plug is inserted within a casting hole, are deflected toward the outer second end of the plug and disposed in tight frictional engagement with the walls of the core hole so as to preclude any subsequent movement of the closure plug outwardly of the core hole.

3,814,137

INJECTION SITE FOR FLOW CONDUITS CONTAINING BIOLOGICAL FLUIDS

Felix Jesus Martinez, Palatine, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Jan. 26, 1973, Ser. No. 326,737
Int. Cl. F16l 11/12
U.S. Cl. 138—103 8 Claims

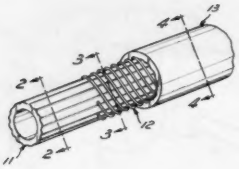


An injection site for a flow conduit for biological fluids and the like, such as blood or parenteral solutions, is provided having improved resistance to leakage through needle punctures, even when the pressure within the flow conduit is substantially different from the pressure outside of the conduit. The conduit comprises tubing made of a biologically compatible material, in which a portion of the tubing is surrounded by an elastomeric sleeve injection site. A second elastic sleeve surrounds the first elastomeric sleeve, the second sleeve having an unstretched inner diameter which is less than the outer diameter of the elastomeric sleeve. As a result, the elastomeric sleeve is compressed by the second sleeve, whereby the sealing of the elastomeric sleeve after puncture by a needle is improved.

3,814,138
HOSE CONSTRUCTION

Louis B. Courtot, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Oct. 18, 1972, Ser. No. 298,566
Int. Cl. F16l *11/08*
U.S. Cl. 138—124 7 Claims

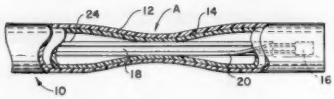


A reinforced plastic hose is disclosed which includes an inner core, a braid, and a protective cover. The inner core is provided with a plurality of rounded ridges and valleys extending longitudinally along the outer peripheral surface thereof. The braid is disposed on the ridges and is tensioned so that the ridges hold the braid radially spaced from the valleys. When the protective cover is extruded over the inner core and braid, it flows into the space between the valleys and the braid so that the braid is encapsulated about its entire peripheral extent by the protective cover at the locations of the valleys to lock the braid against movement relative to the protective cover. The tension in the braid is insufficient to radially inwardly deflect the rounded surface of the ridges and embed the braid in the ridges, so that the braid and protective cover can move together longitudinally along the inner core when the hose is deflected. Relative rotational movement between the protective cover and the braid is prevented by the spline-like engagement of the protective cover and inner core.

3,814,139
INSULATING CONNECTOR

Patrick V. Loyd, West Laurel, and Samuel M. Mills, University Park, both of Md., assignors to Stone Industrial Corporation, College Park, Md.

Filed Aug. 23, 1972, Ser. No. 282,977
Int. Cl. F16l *9/12*
U.S. Cl. 138—141 6 Claims

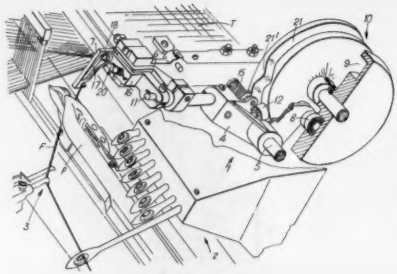


A laminated tubular connector for splicing or terminating electric conductors, comprising an outer layer of a heat shrinkable dielectric material, e.g., polyethylene terephthalate, and an inner layer of relatively soft, self-adhesive, low temperature flowable thermoplastic material, preferably a polyvinyl acetate composition. When heat is applied to the connector, the outer layer shrinks and the inner layer functions as a sealant and a cushioning agent. In some applications, the adhesiveness of the inner layer may be used to hold the connector in place during subsequent operations by pinching the connector so that the depressed portions of the tube adhere to each other prior to heating the connector to shrink the outer layer.

3,814,140
CUTTING DEVICE FOR LOOMS

Giuseppe Serturini, Gorno, Italy, assignor to Somet Societa Meccanica Tessile S.p.A., Colzate, Italy

Filed June 21, 1972, Ser. No. 264,919
Claims priority, application Italy, June 21, 1971, 26139/71
Int. Cl. D03d *47/36*
U.S. Cl. 139—302 6 Claims

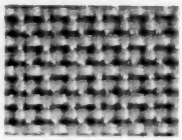


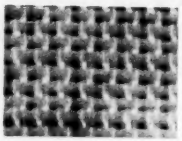
A device to perform the cutting of weft threads in shuttleless looms provided with grippers for carrying the weft threads, in which a cutting blade arranged substantially perpendicular to the weft threads co-operates with a counter blade in respect to which it is operated under the control of cam means. In a first embodiment the blade is perpendicular and in a second embodiment it is parallel to the working path of the grippers.

3,814,141
METHOD OF WEAVING ON WATER JET LOOM

Seiki Iribe; Norihisa Yamaguchi, and Tukasa Kobayashi, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 7, 1973, Ser. No. 339,383
Claims priority, application Japan, Mar. 13, 1972, 47-25370
Int. Cl. D03d *47/32*
U.S. Cl. 139—127 P 3 Claims





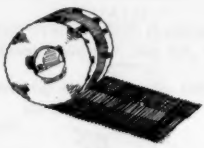
A method for weaving a warp and a weft on a water jet loom, wherein a desized interlaced yarn with the individual constituent filaments being randomly twisted and interlaced is used as the warp and an ordinary non-interlaced yarn is used as the weft, and the weaving is carried out while maintaining the coefficient of static friction of the warp against the weft in the wet state at not more than 0.6, and the water-insolubility of the warp and the weft at 30 to 90 percent.

3,814,142

GASKETING TAPE WOVEN OF STAPLE GLASS FIBER

Irvin Barnett, Martinsville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed May 1, 1972, Ser. No. 248,920
Int. Cl. D03d *15/12*
U.S. Cl. 139—420 C 7 Claims



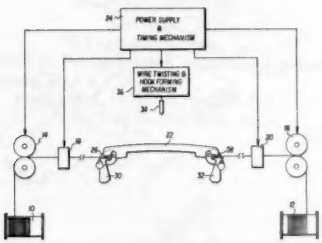
A soft resilient gasketing tape of woven glass yarn comprises yarn of random length staple glass fibers. Due to the random length of the fibers and a high degree of fiber disarray in the yarn, the yarn is lofty and compressible. To strengthen the yarns, reinforcing strands such as PVA yarn are helically wrapped about the glass yarns. The tape is made with both a solid construction and a drop-warp construction wherein a longitudinally extending void is provided in the tape.

3,814,143

METHOD AND APPARATUS FOR MAKING FRAMES FOR STRUT-TYPE GARMENT HANGERS

Dayton W. Barnes, and Robert D. Chiles, both of Greeneville, Tenn., assignors to Ja-San, Inc., Greenville, Tenn.

Filed Mar. 26, 1973, Ser. No. 344,645
Int. Cl. B21f *45/02*
U.S. Cl. 140—81.5 7 Claims



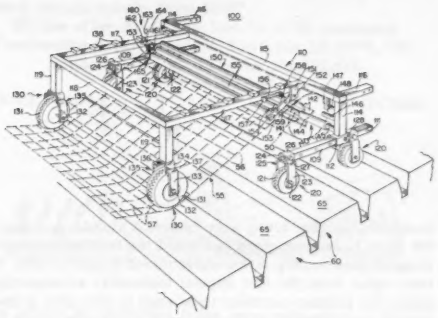
Method and apparatus are disclosed for making the wire frames for strut type garment hangers in which the hanger hook portion is single stranded and the shoulder portions include oppositely facing side angle bends for insertion in the hanger tube or strut. Strands of wire are fed along a common axis toward each other from separate reels of wire. The ends of the wire strands enter means for forming the shoulders of the resulting hanger frame and for forming side angle bends and hooks at the shoulders and are cut to different lengths. After formation of the shoulders and side angle bends and hooks, the opposite ends of the previously cut wire strands are twisted together and the longer strand is bent to form the hanger hook.

3,814,144

WIRE MESH WORKING APPARATUS

Owen C. Spencer, Blue Island, Ill., assignor to Metropolitan Chicago Baptist Association, S.B.C., Broadview, Ill.

Continuation-in-part of Ser. No. 25,970, April 6, 1970, Pat. No. 3,688,810. This application Feb. 3, 1972, Ser. No. 223,190
Int. Cl. B21f *33/00*
U.S. Cl. 140—107 32 Claims



A reinforcing wire mesh working apparatus includes a frame having pairs of support wheels and a spindle for rotatably supporting a roll of wire mesh web on the frame so that the web may be unrolled and passed beneath a pair of the support wheels for decontouring the web; the frame, which may be adjustable in height or length, also carries additional decontour means and a removable bender for bending the web to desired angular configurations, the additional decontour means and the spindle may be mounted in different positions on the frame. Two manually operable embodiments of the wire mesh working apparatus are disclosed. Also disclosed is a powered wire mesh working apparatus which includes an electrically powered web feed device, and a hydraulically powered bending mechanism, web cutter and frame height-adjusting means.

3,814,145

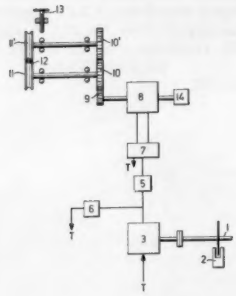
WIRE MESH WELDING MACHINE

Hans Gott; Klaus Ritter; Josef Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed June 16, 1971, Ser. No. 153,757
Claims priority, application Austria, July 31, 1970, 7000/70; Great Britain, Dec. 21, 1970, 60644/70
Int. Cl. B21f *27/10*
U.S. Cl. 140—112 13 Claims

A wire mesh welding machine in which a plurality of line-wires arranged side by side in parallel relation are fed through the machine intermittently and cross-wires are fed to the machine at right angles to the line-wires and are welded to the line-wires at their respective points of contact, the cross-wires being drawn off a storage reel and cut to length by means of feed rollers and a cutter which are both driven by the main shaft of the machine. The lengths of the individual cross-wires severed from the wire drawn off the storage reels are controlled by an electronic control system which governs the action of the feed rollers in direct dependence on the length of wire unreeled in each cycle of operation of the machine. The electronic control system includes a cycle controller driven by

the main shaft of the machine, the cycle controller delivering, in each working cycle of the machine, a start signal which causes a drive between the main shaft and the feed rollers to be engaged, a measured value transducer, controlled by the rotation of the feed rollers, or by the advance of the cross-wire, which produces a signal which, through an adjustable



counter-controller, acting as a reference transducer, causes the drive to be disengaged again and the feed rollers to be stopped after feeding of a predetermined length of wire. A reset signal from the first impulse transmitter subsequently causes the counter-controller to be reset to zero after a time interval corresponding to the feeding of a maximum length of cross-wire.

3,814,146

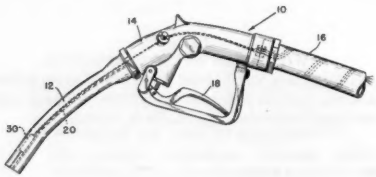
ELECTRONIC DISPENSING NOZZLE

Theodore J. Mesh, Greensboro, N.C., assignor to Gilbert and Barker Manufacturing Company, New York, N.Y.

Continuation of Ser. Nos. 114,050, Feb. 9, 1971, abandoned, and Ser. No. 734,046, June 3, 1968, abandoned. This application Mar. 28, 1972, Ser. No. 238,987

Int. Cl. B65b *3/04*

U.S. Cl. 141—1 **10 Claims**



An electronic device for automatically controlling the delivery of fluid by a fluid dispenser into a receptacle utilizing a fluid sensing device preferably placed on the dispensing nozzle which is stimulated to vibrate at its natural frequency so that the vibrations can be employed to generate an electrical signal of commensurate frequency. The generated signal is then introduced to responsive circuitry that will open or permit opening of the dispenser valve to allow fluid to pass through the nozzle so long as the sensing device vibrating frequency remains unchanged and into the receptacle but will close the valve to terminate fluid flow when the sensing device vibrating frequency is altered.

3,814,147

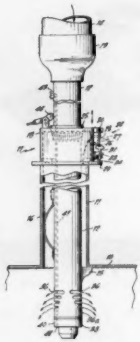
FLUID FILLING SYSTEM

Thyge L. Lindberg, 470 N. Brookside Ave., Roosevelt, N.Y. 11575

Filed Mar. 14, 1973, Ser. No. 341,039

Int. Cl. B67c *3/00*

U.S. Cl. 141—94 **8 Claims**



A fluid filling system which includes a dispensing pipe and means for sealing the pipe to a storage tank. Fluid dispensing slots are cut in the lower end of the pipe for directing the input fluid horizontally so as not to stir up sediment which may have accumulated at the bottom of the tank. The sealing means includes a lug for engaging the inside surface of the tank, a sealing disk for clamping on the upper portion of entrance conduit, and a holding pawl for positioning the sealing disk on the pipe.

3,814,148

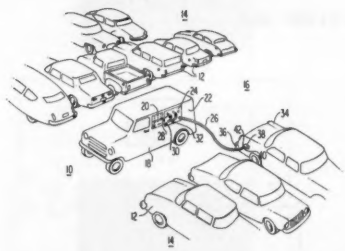
VEHICLE FUELING APPARATUS

Wolfgang J. Wostl, South Holland, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed July 19, 1972, Ser. No. 273,217

Int. Cl. B67d *5/00*

U.S. Cl. 141—98 **28 Claims**



A system for providing maintenance service to vehicles. A vehicle servicing unit is provided with a plurality of fuel sources, means for supplying fuel from the sources to vehicles, and means for automatically registering billing data. A vehicle to be serviced is equipped with an electrical connector including pins that are wired to give a coded identification number, pins that are wired to give a coded fuel-type indication, and pins to activate the system, and a mating connection is provided on the servicing unit. The system has all electrical components enclosed in a pressurized cabinet to ensure that fuel vapors cannot get into the area adjacent those components.

The system permits supplying of other items such as lubricating oil, and the billing circuitry ensures that the correct charge is made for such items so that a customer is not billed for items delivered to a previous customer. Means are also provided for withdrawing fuel vapors and overflow liquid fuel from the area adjacent the delivery nozzle to a disposal, rather than allowing them to escape to the atmosphere.

3,814,149

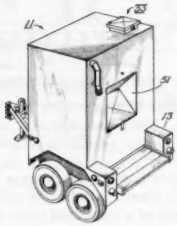
CEMENT HANDLING CONTAINER

Milton L. Dunavant, 6400 McCullar Rd., Fort Worth, Tex. 76117

Filed May 5, 1971, Ser. No. 140,520

Int. Cl. B65b *1/00, 83/06*

U.S. Cl. 141—231 **13 Claims**



The specification discloses a portable container for receiving and storing dry cement in powder form and which may be unloaded manually. The container has a first inlet located at the top region for receiving the cement from a pneumatic charging device. A vent is provided at the top of the container for relieving gas pressure from the container. A second inlet is formed through the sidewall structure of the container for manually allowing a person to remove cement from the container. Plate structure interior of the container surrounds the second inlet forming a passageway extending toward the bottom of the container. The lower edge of the passageway is above the bottom of the container but below the lower edge of the second inlet. The passageway has a top wall which slopes downwardly from the top of the second inlet toward the interior of the container. A door has one end pivotally coupled to the sloping top wall of the passageway at a level intermediate the lower and top edges of the second inlet. The other end of the door may be moved upward to open the passageway and downward to an inclined closed position adjacent to the lower edge of second inlet.

3,814,150

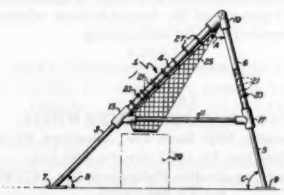
TRASH RECEIVER

William Gower, St. Petersburg, Fla., assignor to Ecolonet, Inc., St. Petersburg, Fla.

Filed Aug. 8, 1972, Ser. No. 278,764

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—337 **9 Claims**



A back stop and refuse receiver has a frame which holds a flexible net in generally upright position above the ground with a hole in the net's bottom under which receptacles are placed. The frame preferably has telescoping beams, that permit adjustments to be made to the height of the net above the ground. The frame can be set on the ground adjacent roadsides so that passing motorists and car passengers can toss cans, bottles and other trash into the net, whereupon the trash collects in the receptacles placed beneath the net. The frame holds the net in angular or curved positions to present as large a target as possible to passing cars. Owing to the adjustable parts and quick disconnect parts, the receiver can be readily set up and moved to various selected sites.

3,814,151

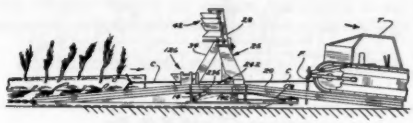
BLADE CRADLE FOR A TREE DELIMBER

Eino J. Jouppi, Isabella, Minn. 55607

Division of Ser. No. 91,875, Nov. 23, 1970, abandoned, Continuation-in-part of Ser. No. 3,941, Jan. 19, 1970,. This application May 12, 1972, Ser. No. 252,619

Int. Cl. A01g *23/08*

U.S. Cl. 144—2 Z **2 Claims**



A device for delimbing felled trees with which a tree is drawn through the device and a blade cradle for supporting the trunk of the tree and for cutting off the branches on substantially the lower or underhalf of the tree as the tree progresses through the device, together with a similar blade cradle mounted on a swinging arm which when lowered causes the blades to engage the upper half of the tree and cut off the limbs, the tree being drawn by a tractor and the swinging arm being lowered by mechanism actuated by the movement of the tree.

3,814,152

STUMP PULLING AND CRUSHING DEVICE

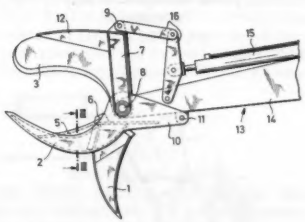
Kyosti Pallari, 95385 Tervola, Finland

Filed Sept. 22, 1972, Ser. No. 291,351

Claims priority, application Finland, Sept. 24, 1971, 2676/71

Int. Cl. B27c *9/00*

U.S. Cl. 144—2 N **5 Claims**

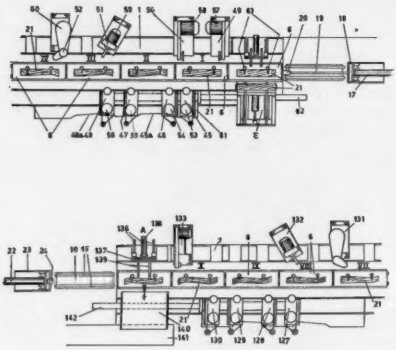


Apparatus for the combined removal and crushing of tree stumps which is adapted to be attached to the jib of a work machine, said apparatus including a downwardly extending hook for stump removal, rearwardly extending arms for supporting the removed stump, the arms being spaced apart to provide a gap between and a rotatable cutting blade aligned with the gap and arranged to split the supported stump.

3,814,153
APPARATUS FOR PERFORMING A SERIES OF OPERATIONS ON A SUCCESSION OF WOOD WORKPIECES

Erich Schmidt, Wien, Austria, assignor to Maschinenfabrik Zuckermann Komm. Ges., Wien, Austria

Filed July 24, 1972, Ser. No. 274,518
Claims priority, application Austria, July 23, 1971, 6435/71
Int. Cl. B27m *3/18;* **B27c** *5/02*
U.S. Cl. 144—3 R **11 Claims**

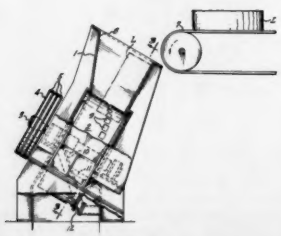


A succession of wooden workpieces are each retained on a carriage forming part of a train of carriages pushed stepwise along an upper guide track along which are arranged a plurality of woodworking machines. A workpiece is loaded automatically onto the furthest upstream carriage and prepared as it moves along and is finally removed from its carriage when this carriage reaches the downstream end of the track. The carriage is then turned over and sent upstream to take on a new workpiece. Midway in the working track there is provided an apparatus having two arms each provided with a rotatable head having jaws which grip the workpiece's ends. Then the arms lift and turn the workpiece over and set it back on its carriage so that its other face can be worked on.

3,814,154
INCLINED CHIPPER

Thomas W. Nicholson, Seattle, Wash., assignor to Nicholson Manufacturing Company, Seattle, Wash.

Division of Ser. No. 883,038, Dec. 8, 1969, Pat. No. 3,661,192. This application May 1, 1972, Ser. No. 248,934The portion of the term of this patent subsequent to May 9, 1989, has been disclaimed.
Int. Cl. B27l *11/02*
U.S. Cl. 144—172 **1 Claim**

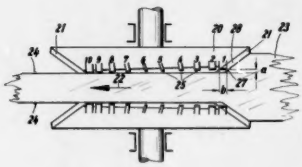


A rotating chipping drum carrying a spiral row of bits is mounted in a hollow body with a portion of its periphery exposed to a chipping chamber for holding log sections to be chipped. The rotative axis of the chipping drum may be inclined to urge a log section toward one end of the chipping chamber.

3,814,155
TOOL HEADS FOR USE IN MACHINING TIMBER

Alfred Reuter, Oberkirch/Baden, Germany, assignor to Gebruder Linck, Baden, Germany

Filed Nov. 16, 1972, Ser. No. 307,297
Claims priority, application Germany, Nov. 27, 1971, 2158913
Int. Cl. B27c *1/08*
U.S. Cl. 144—219 **6 Claims**



The present specification discloses a tool head for use in machining timber trunks into beams and/or planks. The tool head is in the form of a truncated cone, hacking blades being attached to its periphery and extending over a generating line of the cone. Finishing blades which are provided on and project from the smaller area end of the conical head, are arranged in groups, the cutting edges of the finishing blades in a group being aligned substantially parallel to each other and a group of finishing blades being located between each two hacking blades. The tool head can be rotatably driven about its longitudinal axis, the finishing blades in each group being graduated along the axis of the tool head in such a way that each successive finishing blade when used on a timber trunk, is closer to the timber trunk than the preceding finishing blade taken in the direction of rotation of the tool head. The hacking blades process the side segments of a timber trunk as the trunk is passed over the smaller area end of the rotating tool head, in a direction perpendicular to the rotational axis of the tool head and the finishing blades smooth the even surface produced on the timber trunk.

3,814,156
THREADED ARTICLES WITH LOCKING OR SEALING COATINGS

Andrew Bachmann, Weatogue, and Robert E. Batson, Newington, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Sept. 27, 1971, Ser. No. 184,196
Int. Cl. F16b *39/00*
U.S. Cl. 151—14.5 **14 Claims**

Threaded fastening members are provided which have their threaded surfaces partially or fully coated with a composition containing a microencapsulated liquid adhesive and a torque-tension control agent which brings the torque-tension relationship of the coated threaded member to a minimum of approximately 80 percent of the torque-tension relationship of the threaded member without said coating.

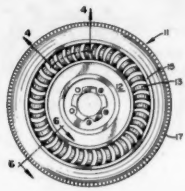
3,814,157
NON-PNEUMATIC VEHICLE WHEEL

Edward J. Kowatch, 3405 Birch Ave., Allentown, Pa. 18103

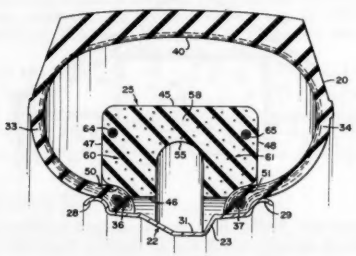
Filed Jan. 20, 1972, Ser. No. 203,116
Claims priority, application Philippines, Dec. 16, 1971, 6363
Int. Cl. B60b *9/06*
U.S. Cl. 152—17 **1 Claim**

A non-pneumatic vehicle wheel utilizing a conventional pneumatic wheel rim, a continuous helical spring annulus and

a pneumatic tire casing. The helical spring is secured around the wheel rim and the casing overlies the outer peripheral portion of the helical spring and serves as the ground engaging element of the wheel.



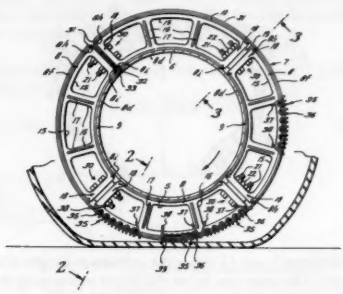
3,814,158
RUN FLAT DEVICE FOR TIRES
John Charles Ryder, Doylestown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Apr. 3, 1970, Ser. No. 25,476
Int. Cl. B60c *17/04*
U.S. Cl. 152—158 **7 Claims**



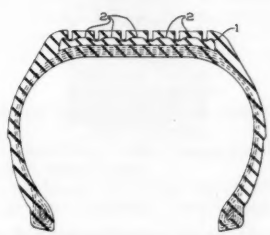
A one piece annular non-pneumatic run flat device for use with a pneumatic tire and a one piece rim. The run flat device has bead engaging surfaces which engage the beads of the tire which beads in turn engage respective flanges on the rim. The inner diameter of the run flat device is about equal to or greater than the outside diameter of the rim and in use, the run flat device is spaced from the rim. An outer annular surface on the run flat device is spaced from the crown of the tire in the inflated condition thereof; however, upon deflation of the tire the crown engages the outer annular surface of the run flat device and is supported by way of the bead engaging surfaces, tire beads and rim. The cross section of the run flat device is preferably designed to bend toward the rim centerline in mounting of the tire and the preferred material of construction of the run flat device is a polyurethane material.

3,814,159
ARRANGEMENT FOR TUBELESS TIRE
William L. Lindley, P.O. Box 58584, Houston, Tex. 77058
Filed Nov. 15, 1972, Ser. No. 306,893
Int. Cl. B60c *17/04*
U.S. Cl. 152—158 **14 Claims**

An arrangement for positioning inside a tubeless tire on a wheel rim includes annular segments that are adapted to be secured together to form a ring on the rim. A band surrounds the annular segments and has its end secured to an adjacent pair of the annular segments to provide a continuous surface. Resilient means, preferably in the form of spring means, is positioned on said annular segment and overlaps said band, with the annular segments and band being constructed and arranged to maintain said spring means thereon while accommodating circumferential movement of said spring along said band when the tubeless tire engages thereagainst to aid in feeding the tubeless tire around the wheel rim when deflated.



3,814,160
TREAD WEAR INDICATOR
Jack R. Creasey, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sept. 18, 1972, Ser. No. 289,924
Int. Cl. B60c *5/00*
U.S. Cl. 152—330 **12 Claims**

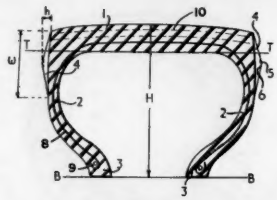


Tires having a tread wear indicator are provided wherein the tread has a surface portion of a first color and an interior sub-surface tread wear indicator portion of a contrasting color. The tread has the same desirable wearing properties as carbon reinforced tire treads but at least one of the portions contains a reinforcing siliceous pigment and preferably essentially all of the reinforcing pigment is siliceous pigment.

3,814,161
PNEUMATIC TIRE
Leslie Vernon Powell, Lichfield, and Reginald Harold Edwards, Sutton Coldfield, both of England, assignors to Dunlop Holdings Limited, London, England
Filed June 7, 1971, Ser. No. 150,564
Claims priority, application Great Britain, June 20, 1970, 30031/70
Int. Cl. B60c *5/00, 13/00, 19/00*
U.S. Cl. 152—352 **11 Claims**

A pneumatic tire having in the region of the sidewalls adjacent to the tread an annular layer of rubber, in addition to

the normal sidewall rubber, the annular layer having a substantially triangular cross section. The width of the triangle

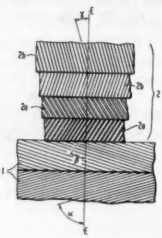


base is between 5 and 12 times the maximum height of the annular layer. The layer can be on the inside or the outside of the sidewall, of which the following is a specification.

3,814,162
PNEUMATIC TIRE

Taizo Hashida, Nishinomiya; Masaru Okumura, and Hiroyasu Fujishima, both of Osaka, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Oct. 30, 1972, Ser. No. 301,915
Claims priority, application Japan, Oct. 28, 1971, 46-86047
Int. Cl. B60c *9/20*
U.S. Cl. 152—361 DM **6 Claims**



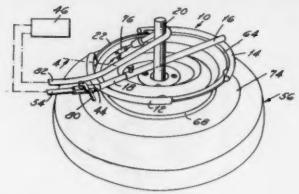
In a semi-radial ply tire having improved high speed durability, wear resistance and cornering properties while retaining good riding comfort, the carcass consists of at least two plies of nylon cords crossing at 70° – 80° with respect to the equatorial line of the tire, and the breaker consists of an inner layer of two plies of steel cords crossing at 15° – 25° with respect to said line and of an outer layer of two plies of textile cords crossing at 10° – 20° with respect to said line, provided that the layer of the steel cords shares 40 – 65 percent of the entire strength of the breaker layer.

3,814,163
ADJUSTABLE BEAD SEATER

Malcolm Jean Charles, and Donald G. Runge, both of Lodi, Calif., assignors to B & J Manufacturing Company, Glenwood, Ill.

Filed Oct. 18, 1972, Ser. No. 298,657
Int. Cl. B60c *25/12*
U.S. Cl. 157—1.1 **5 Claims**

Apparatus for seating the beads and inflating tubeless tires on a vehicle wheel is provided. The apparatus for seating the tire beads comprises a pair of oppositely disposed tubular segments having orifice means for injecting air under pressure through the space between the wheel rim and the tire bead.

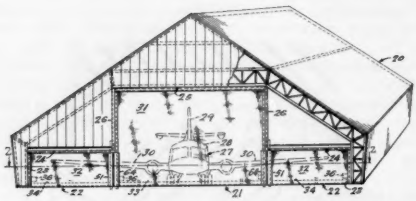


The segments are interconnected by telescoping tubular structure to permit adjustment of the apparatus for use on tires of different sizes.

3,814,164
FLEXIBLE DOOR ASSEMBLAGE

Ralph L. Kuss, Findlay, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio

Filed Jan. 22, 1973, Ser. No. 325,585
Int. Cl. E06b *9/08*
U.S. Cl. 160—120 **9 Claims**



A multi-part flexible door assemblage for a building such as an aircraft hangar, which has an opening thereinto with a higher section and at least one lower adjacent section. The door consists of at least two flexible sheet-like portions, three in the case of an aircraft hangar, including a higher portion and at least one adjacent lower portion. Each sheet-like portion has a power driven roller secured at its lower or upper edge with means to rotate the roller to wrap or unwrap the respective sheet-like portion thereon to open or close the door. Vertical guides for the outer sides of the door portions extend along outer side frames of both the higher and lower sections. The building frame also includes an intermediate vertical frame connecting top horizontal frames of the higher and lower sections of the opening. Moveable guides are provided for the adjacent inner ends of the door portions and means are provided for guiding the moveable guides along the intermediate vertical frame extending between the tops of the higher and lower sections. The moveable guides extend below the intermediate frame and across the inner side of the lower section of the building opening when the door is closed and lie adjacent the intermediate vertical frame when the door is open.

3,814,165
FIRE DAMPER AND METHOD OF FABRICATING SAME

Francis J. McCabe, Hollow Horn Rd., Erwinna, Pa. 18902

Filed Oct. 26, 1971, Ser. No. 192,006
Int. Cl. E05d *15/26*
U.S. Cl. 160—207 **2 Claims**

A folding blade fire damper is provided with a means for retaining the upper most blade, which means is integral with

the damper frame. There is also provided a means for retaining the closure spring which means is integral with the frame. The method of notching out the frames to provide these

means is disclosed. The spring closure is attached to the last blade of the damper in a novel manner.

The blades are retained and articulated in combination with a novel connector member.

3,814,166

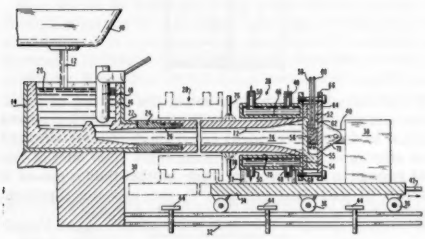
METHOD AND APPARATUS FOR CONTINUOUS CASTING

Leonard Watts, Cedarhurst, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. Nos. 143,055, May 13, 1971, Pat. No. 3,680,624, and Ser. No. 171,283, Aug. 12, 1971, abandoned. This application July 5, 1972, Ser. No. 268,977

Int. Cl. B22d *11/08*

U.S. Cl. 164—73 **41 Claims**



A tundish receiving molten metal and a cooled, closed-end mold are moved relatively apart so that the mold forms a solidified shell of a casting such as a billet, for example, molten metal flowing through the solidified shell to the mold. At least a portion of the closed end or plug of the mold is heated at least during a preheating period to limit or eliminate the formation of a solidifying metal membrane on at least a portion of the closed end. A lubricant and/or a seal may be introduced between an axial wall structure of the mold and the mold plug, and at least a portion of the mold is oscillated relatively to the shell in the mold during casting. The plug in one position thereof may occupy a forward or starting position in the end portion of axial wall structure nearest the tundish. In addition to preheating the tundish before receiving molten metal for flow therethrough, at least a portion of the plug is heated in its forward position during the preheating operation. The axial wall structure may be heated in the preheating operation to remove any condensation from the interior thereof. Thereafter, the near end face of the axial wall structure is abutted against a flange of the tundish prior to the flow of metal through the tundish to the mold. This retraction of the plug produces, with the axial wall structure coacting with the plug, a mold having a variable effective mold cavity.

3,814,167

PROCESS FOR SEPARATING NON-METALLIC INCLUSIONS FROM HOT LIQUID METAL

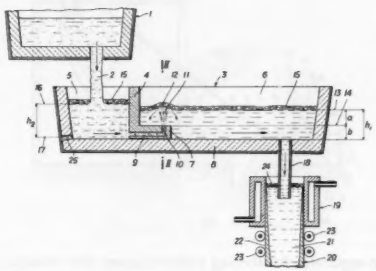
Friedrich Listhuber; Thorwald Fastner, and Ernst Bachner, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft, Linz, Austria

Filed June 1, 1972, Ser. No. 258,671

Claims priority, application Austria, June 4, 1971, 4850/71; Nov. 14, 1971, 9483/71

Int. Cl. B22d *11/10*

U.S. Cl. 164—82 **4 Claims**



The disclosure relates to a process for separating non-metallic inclusions from hot liquid metal, in particular from aluminum killed soft steel, in continuous casting plants, wherein the metal supplied into a tundish is guided at least once in upward direction to the surface of the metal sump in said tundish under formation of at least one stream at a speed greater than that of the metal in the tundish prior to its being deflected, whereby a wave is formed at the surface of the metal covered by slag. The metal is guided towards the surface of the metal sump by means of a partition wall having at least one opening from which a canal extends in upward direction to end at a distance of from 3 to 30 cm below the metal sump surface.

3,814,168

METHOD FOR THE CENTRIFUGAL PRODUCTION OF METAL TUBES

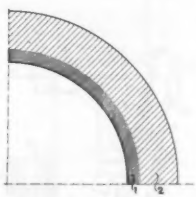
Alain Louis Albert Royer, Fumel, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Sept. 13, 1972, Ser. No. 288,824

Claims priority, application France, Sept. 24, 1971, 71.34380

Int. Cl. B22d *13/00*

U.S. Cl. 164—114 **7 Claims**



A method for the centrifugal production of a metal tube having a composition which varies within the thickness of the wall of the tube, comprising the steps of pouring a mass of molten metal in a rotary mould then, before the complete solidification of said mass of metal, depositing on the mass of metal in the mould a molten slag containing addition elements, allowing the metal and the slag to solidify while continuing to rotate the mould until solidification of both of them, and removing the solidified slag.

3,814,169
DUMMY BAR HANDLING SYSTEM

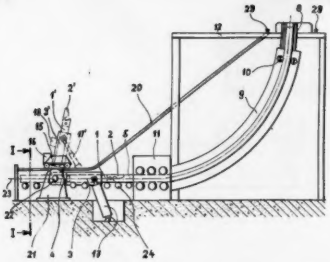
Bernhard Knell, Thalwil, and Werner Bruderer, Feldmeilen, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Aug. 7, 1972, Ser. No. 278,645

Claims priority, application Switzerland, Aug. 6, 1971, 11594/71

Int. Cl. B22d *11/08*

U.S. Cl. 164—274 **8 Claims**



An apparatus for feeding a short dummy bar from the path of travel of a casting into the region of the casting mold for introducing the dummy bar through the casting mold into a successive at least partially curved roller apron or strand guide. The apparatus of this development comprises a cartridge or cassette which can be located in a position for introduction of the dummy bar into the path of travel of the casting and a transport mechanism for the dummy bar. The cartridge provided with stop means and co-operating with the transport mechanism is mounted to be pivotal, the pivot axis of the cartridge being arranged at the path of travel of the casting or at the direct neighborhood thereof. In the pivoted position of the cartridge, the stop means exhibits a spacing from the path of travel of the casting which is greater than one half of the thickness of the cast casting.

3,814,170
APPARATUS FOR MELTING AND CASTING MATERIAL UNDER PRESSURE

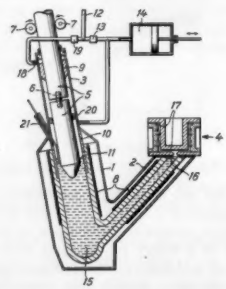
Friedhelm Kahn, 2, Muhlbachstrasse, 6332 Ehringshausen, Germany

Filed Feb. 11, 1972, Ser. No. 225,512

Claims priority, application Germany, June 8, 1971, 2128425

Int. Cl. B22d *17/06*

U.S. Cl. 164—309 **9 Claims**



In a melting furnace the melting zone is sealed off from the air and a pipe is connected to the bottom of the melt, which pipe reaches outside the furnace with its upper end to the height of the molten material inside the furnace. The casting mold is arranged on the top of the pipe. An atmosphere of protective gas is established above the surface of the molten material in the furnace; the pressure of the protective gas being controlled by a special equipment. Casting is accomplished by introducing the material to be molten through a gas lock and through the protective gas atmosphere into the melt, causing the pressure inside the furnace to increase and forcing the molten material through the rising pipe into the mold. After the mold is filled the pressure of the gas is increased in order to feed the shrinkage and to achieve a fine grained and dense casting.

3,814,171
STATIONARY HEAT EXCHANGER

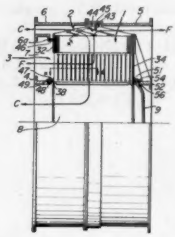
Kenya Nakamura, Okazaki; Yasuo Kondo, Anjo, and Makoto Kuroyanagi, Hekinan, all of Japan, assignors to Nippondenso Co. Ltd., Aichi-Ken, Japan; Toyoto Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan and Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya-shi, Aichi-Ken, Japan

Filed Dec. 22, 1971, Ser. No. 211,089

Claims priority, application Japan, Dec. 26, 1970, 45-128995

Int. Cl. F23l *15/02*

U.S. Cl. 165—10 **4 Claims**



A stationary heat exchanger in which a plurality of corrugated heat radiating plates are radially arranged in juxtaposed relation to form independent radial fluid passages between each other, and fluid is passed in the every other ones of said fluid passage in one direction, while another fluid is passed in the rest of said fluid passages in the opposite direction, whereby heat is exchanged between said two fluids.

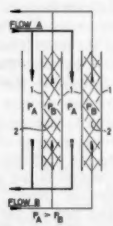
3,814,172
HEAT EXCHANGERS

David Teignmouth Shore, Banstead, England, assignor to The A.P.V. Company Limited, Sussex, England

Filed Mar. 28, 1972, Ser. No. 238,920

Int. Cl. F28d *11/06*

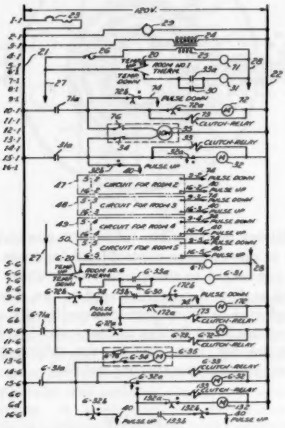
U.S. Cl. 165—12 **9 Claims**



A heat exchange apparatus and method of using it comprising periodically flexing flexible flat heat transfer plates so as to

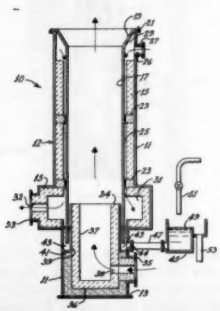
vary the cross section of the flow space, thereby achieving turbulence which promotes improved heat transfer. The variation in cross section may be obtained mechanically or through varying the pressure of the medium on one side of the plate.

3,814,173
CONTROL FOR FORCED AIR HEATING AND/OR COOLING SYSTEM
George M. Coon, Hillside House, Saybrook Rd., Essex, Conn. 06426
Filed June 27, 1973, Ser. No. 374,101
Int. Cl. F24f *3/00*
U.S. Cl. 165—12 **21 Claims**



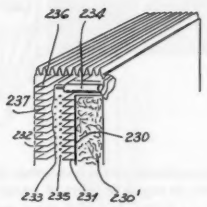
In a forced air heating/cooling system having several individual room thermostats which fully open or fully close the air dampers, the thermostats are interrogated individually in succession to determine how many are demanding heated or cooled air. The forced air fan speed is set automatically in accordance with the total of such demand signals. As each thermostat is satisfied, this demand total is reduced accordingly to lower the fan speed.

3,814,174
STACK TYPE RECUPERATOR HAVING A LIQUID SEAL
Donald Beggs, Toledo, Ohio, assignor to Mildrex Corporation, Toledo, Ohio
Filed Apr. 16, 1970, Ser. No. 29,080
Int. Cl. R05d *23/00*
U.S. Cl. 165—32 **7 Claims**



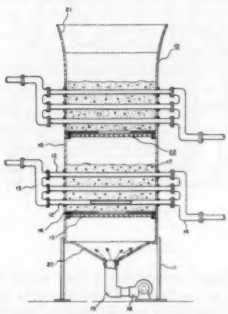
This invention relates to a metallic recuperator having a liquid seal. The liquid seal utilizes a thermal barrier and allows thermal expansion and contraction of the metallic heat exchange surface, while permitting free movement thereof.

3,814,175
VARIABLE INSULATION MEANS UTILIZING CONVECTION GENERATORS
Ingeborg Laing, and Nikolaus Laing, both of Hofener Weg 35-37, 7141 Aldingen bei Stuttgart, Germany
Division of Ser. No. 830,457, June 4, 1969, Pat. No. 3,720,198.
This application Feb. 26, 1973, Ser. No. 335,769
Int. Cl. F28f *27/00*
U.S. Cl. 165—96 **4 Claims**



Variable heat insulation building panel having an outwardly facing wall, an inwardly facing wall, a chamber between the walls and a means for creating eddy currents in the chamber to promote transfer of heat between the two walls in order to reduce insulation effect of the panel.

3,814,176
FIXED-FLUIDIZED BED DRY COOLING TOWER
Ram Gopal Seth, 1112 Yardley Rd., Cherry Hill, N.J. 08034
Filed Jan. 22, 1973, Ser. No. 325,225
Int. Cl. F28d *13/00*
U.S. Cl. 165—104 **3 Claims**

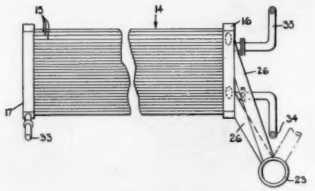


A forced draft dry cooling tower is disclosed wherein the medium to be cooled passes through heat exchanger tubes embedded within a bed of inert particles composed of smaller particles surrounding and embedded in much larger particles. The forced draft through the cooling tower fluidizes the smaller particles but not the larger particles which stabilize the fluidization of the smaller particles and enhance the fluidization and heat exchange effect thereof.

3,814,177
STEAM CONDENSERS

Peter John Harris; Barry Stanford Holmes, and John Lee Ryder, all of Birmingham, England, assignors to GKN Birwelco Limited, Birmingham, England

Filed Feb. 7, 1972, Ser. No. 223,880
Claims priority, application Great Britain, Feb. 11, 1971, 4472/71
Int. Cl. F28b *1/00, 9/08*
U.S. Cl. 165—110 **4 Claims**

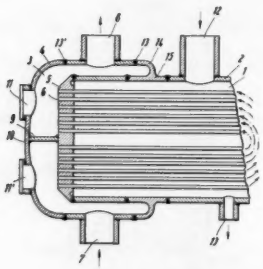


A direct sub-atmospheric steam condenser having horizontal condenser tubes arranged in pairs of banks of tubes. The banks in each pair are inclined to each other and converge upwardly, and the steam inlet header for each bank is connected to a steam manifold which is arranged below the tops of the banks of tubes.

3,814,178
HEAT EXCHANGER

Horst Parussel, Ahrensburg, Germany, assignor to Cass International GmbH, Hamburg, Germany

Filed Nov. 1, 1971, Ser. No. 194,127
Claims priority, application Germany, Nov. 6, 1970, 2054641
Int. Cl. F28b *9/02*
U.S. Cl. 165—158 **2 Claims**

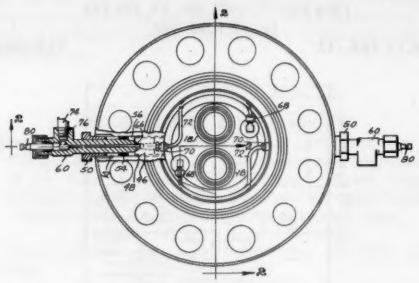


A heat exchanger comprising a feed water chamber and a steam chamber extending to a considerable extent into said water chamber in spaced relationship to the housing wall of said water chamber so that the latter has a bell-shaped contour with the skirt thereof placed in spaced relationship over a portion of the steam chamber, said water chamber being divided by a partition into two sections, one of which communicates with one end of a plurality of pipes in said steam chamber while the other water chamber section communicates with the other end of said pipes, feed water inlet and outlet means respectively communicating with said water chamber sections and being arranged in the skirt portion of said water chamber, and steam inlet and condensate outlet means being provided in said steam chamber.

3,814,179
WELL HEAD SET SCREW PORT EXIT OF CONTROL LINE FOR DOWN-HOLE SAFETV VALVE

John L. Hull, Jr., Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed May 8, 1973, Ser. No. 358,387
Int. Cl. E21b *33/03*
U.S. Cl. 166—89 **3 Claims**

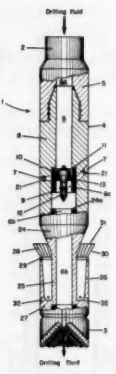


Valves fittings and flexible tubing for connection to the upper ends of one or more control lines for down hole safety valves are connected to these upper ends above the tubing hangers and seals and communicated to the exterior of the head through one or more ports conventionally used for set screws, using disclosed fittings in the ports. Assembled parts may be tested for leaks before the tubing bonnet and remainder of the christmas tree are installed.

3,814,180
WELL FISHING APPARATUS

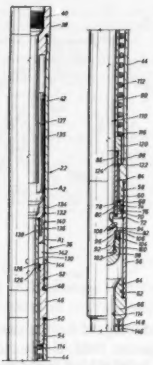
Don L. Oliver, Houston, Tex., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Aug. 31, 1972, Ser. No. 285,141
Int. Cl. E21b *31/08*
U.S. Cl. 166—99 **25 Claims**



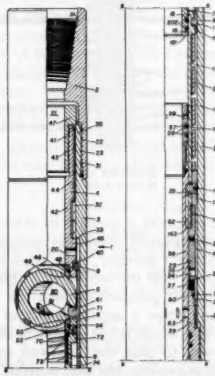
A fishing tool which can be used for dislodging and collecting junk from the walls of a well bore. The tool can be located in a drilling string above a bit, and streams of drilling fluid are jetted outwardly against the wall of the bore to dislodge junk which resides in or upon the wall. A junk basket is located on the tool above the bit, and junk is thus basketed before it falls to the bottom of the hole.

3,814,181
AMBIENT PRESSURE RESPONSIVE SAFETY VALVE
David E. Young, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Dec. 29, 1972, Ser. No. 319,183
Int. Cl. E21b *43/12*
U.S. Cl. 166—224 S 19 Claims



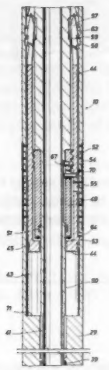
A safety valve apparatus for wells producing well fluid by formation pressure and including a valve mechanism that is normally maintained in the open or flowing position by an urging means and is closed responsive to a predetermined differential pressure developed between flowing pressure, within the valve apparatus and ambient pressure, externally of the valve apparatus. A predetermined differential pressure develops a force overcoming the bias of the urging means and moves the valve mechanism to the closed position thereof. The valve apparatus is provided with means for modifying the effective size of the inlet orifice of the valve mechanism responsive to a predetermined decrease in ambient pressure from a normal operating range, thereby developing the predetermined pressure differential for achieving automatic closure of the safety valve apparatus.

3,814,182
OIL WELL TESTING APPARATUS
Richard L. Giroux, Morgan City, La., assignor to Halliburton Company, Duncan, Okla.
Filed Mar. 13, 1973, Ser. No. 340,778
Int. Cl. E21b *41/00*
U.S. Cl. 166—226 13 Claims



A ball valve type, full opening bore, oil well formation tester utilizes a J-slot mechanism and vertical tool string manipulations to open and close a substantially unrestricted axial bore through the testing tool to allow formation fluid flow through the tool at the command of the tool operator.

3,814,183
APPARATUS FOR DETECTING THE ENTRY OF FORMATION GAS INTO A WELL BORE
Joseph F. Kishel, Clarks Summitt, Pa., assignor to Weston Instruments, Inc., Newark, N.J.
Division of Ser. No. 235,989, March 20, 1972. This application Aug. 29, 1973, Ser. No. 392,706
Int. Cl. E21b *47/10, 17/00*
U.S. Cl. 166—226 7 Claims

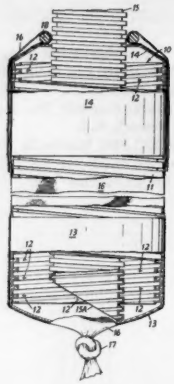


In the preferred embodiment of the invention disclosed herein, a new and improved well tool which is adapted to be coupled in a drill string adjacent to a drill bit includes inner and outer telescoping members which are cooperatively arranged to define an expansible sample chamber for entrapping a discrete sample of drilling mud from a borehole adjacent to the drill bit in a drill string upon telescoping movement of the inner and outer members. Valve means are cooperatively arranged between the telescoping members for selectively closing the sample chamber upon further movement of the telescoping members to expand the sample chamber. In this manner, by coupling force-measuring means to a drill string coupled to the tool the force required to fully expand the chamber is measured for providing a surface indication which is indicative of the percentage of gas entrained in the collected sample.

3,814,184
WELL-POINTS FOR DE-WATERING GROUND
Ronald Noel Allen, and Ernest William Potter, both of London, England, assignors to Henry Sykes Limited, London, England
Continuation of Ser. No. 144,836, May 19, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,459
Claims priority, application Great Britain, June 1, 1970, 26388/70
Int. Cl. E21b *43/08*
U.S. Cl. 166—230 10 Claims

A disposable wellpoint for dewatering ground comprises a body of spirally-corrugated perforated tubing formed of plastics material and covered by a filter sleeve of nylon fabric,

and a suction pipe of spirally corrugated tubing enters the top end of the body. The body, the sleeve, and the suction pipe

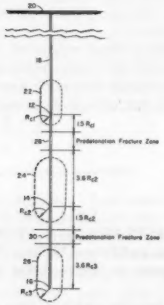


can be severed as lengths from supply reels on site, and the assembled wellpoints can be introduced into the ground in a tubular casing provided with water lances.

3,814,185
METHOD FOR INTERCONNECTING NUCLEAR CHIMNEYS

Charles Robert Boardman, Las Vegas, Nev., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 27, 1973, Ser. No. 336,304
Int. Cl. E21b *43/26*
U.S. Cl. 166—247 **7 Claims**

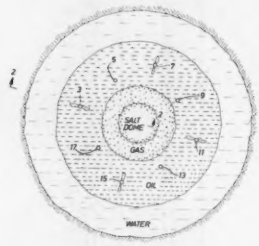


A method of preparing a subterranean formation for the detonation of a plurality of nuclear explosives. Vertical intervals between adjacent, vertically spaced apart nuclear explosive shot points are prefractured by nonnuclear means prior to detonation of the nuclear explosives to assure interconnection of fractures between the two resulting chimneys.

3,814,186
SECONDARY RECOVERY FOR STEEPLY DIPPING RESERVOIRS: COMBINED CELLAR AND ATTIC FLOODING

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 27, 1971, Ser. No. 183,922
Int. Cl. E21b *43/00, 43/20*
U.S. Cl. 166—272 **3 Claims**

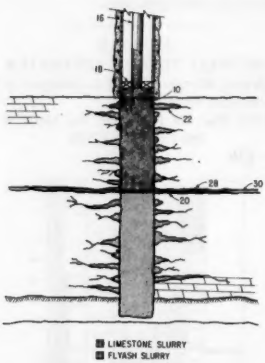


A method of producing oil from a steeply dipping reservoir wherein a hot aqueous fluid is injected into the reservoir which liberates gas from the oil in the reservoir. This gas then travels to the top of the reservoir where it displaces the oil at the top of the reservoir and forces it down to a production well located down dip of the top of the reservoir. The fluid travels to the bottom of the reservoir where it displaces oil upward.

3,814,187
SUBSURFACE FORMATION PLUGGING

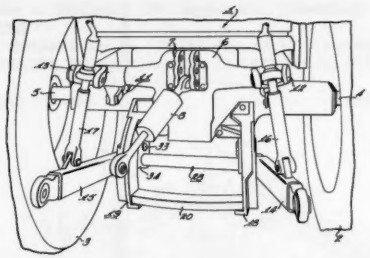
George B. Holman, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed May 14, 1973, Ser. No. 360,222
Int. Cl. E21b *33/138*
U.S. Cl. 166—281 **4 Claims**



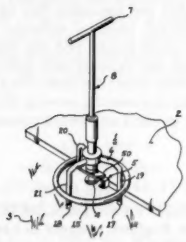
This invention concerns a method of selectively plugging fractures in an underground formation without permanently plugging the "secondary porosity," e.g., vugs, etc., which may be in communication with the wellbore. A slurry of finely divided limestone is first pumped through the well to fill the secondary porosity. Then a second slurry of finely divided solids, such as flyash, which is not soluble in most acids, is injected into the well to plug the interwell fracture system. Thereafter, to aid injectivity, the well is given a low pressure acid treatment to remove the limestone from the secondary porosity.

3,814,188
ELECTRONIC DRAFT LOAD SENSING SYSTEM
Jerome J. Ahne, Elm Grove, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Oct. 2, 1972, Ser. No. 294,313
Int. Cl. A01b *63/112*
U.S. Cl. 172—7 **8 Claims**



An electronic draft load sensing unit for a tractor having strain gauge sensing responsive to draft load on said tractor.

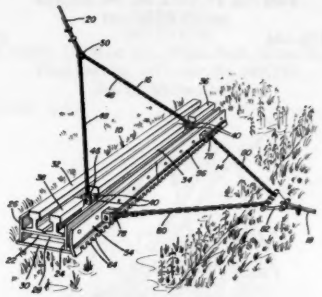
3,814,189
GRASS TRIMMER
William W. Thompson, Phoenix, Ariz., assignor to Mary G. Niven, Phoenix, Ariz.
Filed Dec. 26, 1972, Ser. No. 318,018
Int. Cl. A01b *45/00*
U.S. Cl. 172—13 **7 Claims**



Apparatus is disclosed for cutting a swath of vegetation adjacent watering system sprinkler heads. An open framework houses rotatable cutting blades and positions the cutting blades relative to the sprinkler head. The cutting blades are non-rotatably secured to a shaft, which shaft extends from the open framework. A bushing is disposed intermediate the shaft and the open framework to permit axial movement and rotation therebetween. The mechanism by which the cutting blades are secured to the shaft permits the internal and external diameter of the swath to be varied. The mechanism further includes means for cutting a less than full circle swath about the sprinkler head where the sprinkler head is adjacent a walkway or wall.

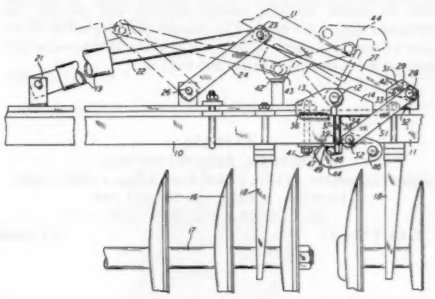
3,814,190
DRAGLINE CLEANER FOR OPEN DRAINAGE DITCHES
William L. Wilson, Savannah, Ga., assignor to Virgil P. Terry and Frank O. Downing, both of Savannah, Ga., part interest to each
Filed Nov. 29, 1972, Ser. No. 310,544
Int. Cl. E02f *3/60*
U.S. Cl. 172—26.5 **9 Claims**

A horizontally elongated weighted body including front and rear sides as well as top and bottom sides. The front and top sides include structure for attaching drag and haul-back bridle chains thereto and the front side of the body includes a longitudinally extending blade structure supported therefrom with the lower edge of the blade structure being toothed and



projecting below the bottom side of the body. In addition, the blade structure is supported from the body for adjustable angular displacement about an axis extending longitudinally of the body whereby the cutting angle of the blade structure may be varied as desired.

3,814,191
POWERED LIFT AND LOCK FOR A FOLDABLE IMPLEMENT FRAME
Lawrence E. Tilbury, Moline, Ill., assignor to J. I. Case Company, Racine, Wis.
Filed Dec. 26, 1972, Ser. No. 318,387
Int. Cl. A01b *63/00, 35/16*
U.S. Cl. 172—311 **5 Claims**



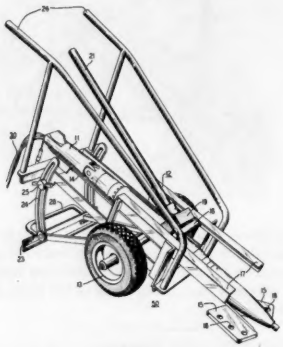
A powered lift and lock for a foldable implement frame having a main frame and a wing frame pivotally mounted on the main frame for folding relative thereto. Disc harrows are suspended on the frames for working the ground in the usual manner. A latch is pivotally mounted on the wing frame and cam-locks with the main frame to hold the two frames in the horizontal position. A hydraulic cylinder is mounted on the main frame and its rod extends to the wing frame and connects therewith for lifting and lowering the wing frame. The connection between the rod and the wing frame is a lost motion connection, and a link extends between the connection of the rod and the latch so that the latch is secured when the wing frame is lowered, and the latch is released in the initial motion of raising the wing frame. Two species are shown, one where the hydraulic cylinder rod connects directly with the wing frame, and the other where the hydraulic cylinder rod connects with the wing frame through a linkage. The wing frame has a support surface which engages a pad on the main frame for supporting the wing frame in folded position on top of the main frame.

3,814,192

APPARATUS FOR LAUNCHING A SOIL BURROWING MOLE

Douglas Rodney Steen, Mt. Bethel, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1972, Ser. No. 301,626
Int. Cl. E21b *1/06*
U.S. Cl. 173—44 2 Claims



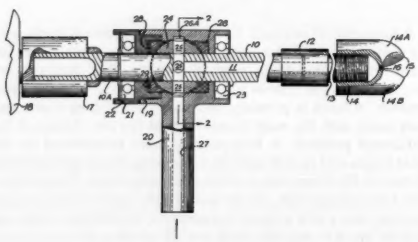
Apparatus and method are disclosed for launching a linear impact subsoil penetrator (mole). The apparatus includes a support platform which can be positioned to provide a selected angle of attack for the mole relative to the soil surface. The linear impact drive of the mole is started; and a restraining force is applied by the apparatus to the sides of the mole to create artificial tunnel traction and prevent the backward slip of the mole. This insures that operation of the mole's linear propulsion system will produce only forward motion and move the mole's nose into the soil.

3,814,193

HYDRAULIC BORING DEVICE

Michael Schneider, 1120 S. Union Ave., Alliance, Ohio 44601

Filed Dec. 6, 1972, Ser. No. 312,734
Int. Cl. E21b *21/00*; E21c *7/00*
U.S. Cl. 173—57 4 Claims



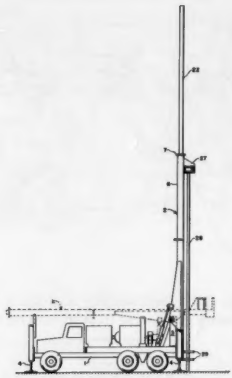
A boring device is disclosed wherein a boring bit is rotated as it is advanced and supplied with water through a hollow interior to facilitate the boring operation. A rotary connection introduces water into the hollow boring bit and its support from one side thereof through an apertured sphere secured to and revolving with the support.

3,814,194

EARTH DRILLING APPARATUS

Wendell L. Reich, and Robert C. Paul, both of Reno, Nev., assignors to Reed Tool Company, Houston, Tex.

Filed July 25, 1972, Ser. No. 275,094
Int. Cl. E21b *3/02*
U.S. Cl. 173—152 5 Claims



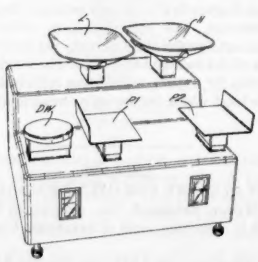
A pair of vertically spaced pistons are normally disposed close together in a tall cylinder, with the lower piston rod rigidly connected to a support below the cylinder, and the upper piston rod connected to the upper end of a tube that extends down around the cylinder. The lower end of the tube supports means for holding the upper end of a drill stem and for rotating it. After the apparatus has been fully extended vertically by hydraulic pressure between the pistons, fluid pressure between each piston and the adjacent end of the cylinder first draws the cylinder and tube down around the lower piston and then draws the tube down around the upper piston, whereby the downwardly moving tube causes the stem-supporting means to exert downward pressure on a drill stem continuously.

3,814,195

WEIGHT QUALITY CONTROL DETERMINATION

Paul Gilbert, Kent, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,387
Claims priority, application Great Britain, Sept. 4, 1972, 40842/72
Int. Cl. G01g *19/00*, *1/18*
U.S. Cl. 177—1 9 Claims



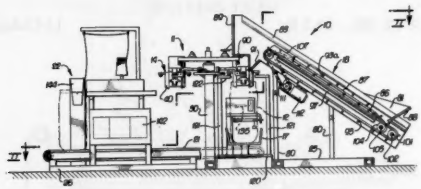
A weighing apparatus consists essentially of a three pan balance with the pans at different pre-set distances from a fulcrum. Preferably a second balance, an equal arm two pan

balance is also provided. These balances enable a method of weight determination to be rapidly carried out to establish the maximum weight that can be marked on a given set of packs while satisfying statistically acceptable practice or legislation.

3,814,196
TWO STATION RECEPTACLE AND WEIGHING APPARATUS

Stanley A. McClusky, 3001 Baylor Ave., Bakersfield, Calif. 93305

Division of Ser. No. 179,761, Sept. 13, 1971, Pat. No. 3,700,054. This application July 13, 1972, Ser. No. 271,495
Int. Cl. G01g *13/00, 13/02*
U.S. Cl. 177—54 **10 Claims**

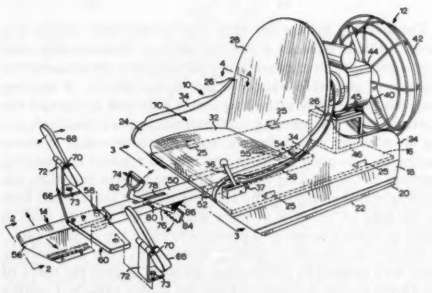


A bag filling and weighing apparatus having a bag applying station and diametrically opposite thereto a single combined filling and weighing station at which simultaneous feeding of articles by both bulk and dribble feed methods is provided, both dribble and bulk feed having a common discharge zone and both dribble and bulk feed being operable until a preselected underweight condition is reached at which time the bulk feed is stopped and the dribble feed continues feeding until a precise final weight is reached at the single station. The apparatus includes means to rapidly transmit weight of each article to a scale before the article is received in a bag or box, and includes means to impart vibrations in a horizontal plane to the bag or box during filling independently of the weight sensing by the scale.

3,814,197
ICE VEHICLE

Miloje Milankov, 237 Harvie Ave., 341, Toronto, Ontario, and Dimitrije Milankov, 5 Harvard St., Toronto, Ontario, both of Canada

Filed Jan. 5, 1973, Ser. No. 321,367
Int. Cl. B62m *27/02*
U.S. Cl. 180—3 R **11 Claims**

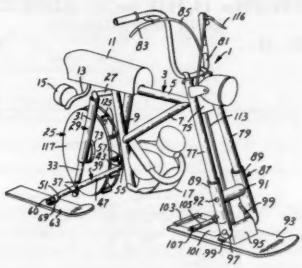


A motor driven ice vehicle capable of being dismantled for transportation, in which a motor is disengagable mounted on a carriage which has collapsible sides and a removable shaft projects forwardly from the carriage with a pivotal guide runner and a pair of foot rests for steering. Preferably the foot rests are mounted for universal pivotal movement on the guide runner.

3,814,198
SKI CYCLE

Virgil R. Seiler, 228 West Ave., Waite Park, Minn. 56387

Filed Dec. 16, 1971, Ser. No. 208,551
Int. Cl. B62m *27/02*
U.S. Cl. 180—6 A **4 Claims**

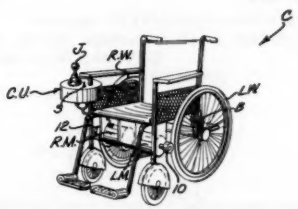


A motorized bicycle converted to a snow travelling vehicle having a front ski, a rear cleated drive wheel, and a pair of rear skis mounted laterally of said drive wheel.

3,814,199
MOTOR CONTROL APPARATUS ADAPTED FOR USE WITH A MOTORIZED VEHICLE

William M. Jones, Shaker Heights, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed Aug. 21, 1972, Ser. No. 282,467
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.5 **10 Claims**



Motor control system for controlling both direction and speed of a DC motor. The system is particularly applicable for controlling direction and speed of a pair of DC reversible motors which independently drive spaced apart wheels on a vehicle, such as a motorized wheelchair. Motor speed is controlled in dependence upon the displacement of a joystick from a neutral position. The displacement is sensed by varying the amount of radiant energy received by a receiver in accordance with joystick movement. The receiver provides a motor speed control signal which has a magnitude that varies as a function of the joystick displacement from its neutral position. This control signal is applied to a motor speed control circuit for controlling the speed of at least one of the motor driven wheels. Motor direction is controlled in accordance with one embodiment by use of switches which are actuated as the joystick is displaced from its neutral position to indicate intended forward, reverse or turning movements. In accordance with other embodiments, of the invention, logic circuitry

determines intended motor direction in dependence upon which one or ones of a plurality of energy beams are interrupted by a mask, movable relative to the beams in dependence upon joystick movement, or upon the amount of light received at plural light sensors when the transmitter is displaced relative thereto by the joystick.

3,814,200

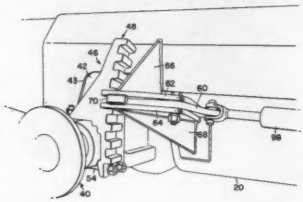
LOCK FOR AN OSCILLATABLE AXLE

Richard William Hirst, Hazel Green, Wis., and Conrad Stone Brooks, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 19, 1973, Ser. No. 342,675

Int. Cl. B60g *19/10*

U.S. Cl. 180—41 **10 Claims**



A vehicle has an oscillatable axle to which is fixed a toothed bar curved arcuately about the axis of oscillation of the axle. A hydraulically operable latch member is mounted on the frame of the vehicle and is selectively removable into and out of engagement with and from the teeth of the toothed member.

3,814,201

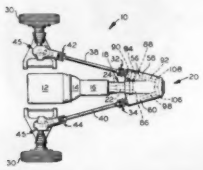
V-DRIVE SYSTEM

Loren James O'Brien, Ft. Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 21, 1972, Ser. No. 219,805

Int. Cl. B60k *23/08, 17/34*

U.S. Cl. 180—44 R **7 Claims**



A low vehicle profile is obtained in a front wheel drive system by providing a V-drive axle center section at the rear of a transmission with a pair of forwardly extending V-shaped output or drive shafts. The output shafts are adapted to drive a pair of angled forwardly extending propeller shafts disposed on opposite sides of the center section so that drive can be transmitted to separate gear units located at each front wheel for individually driving the same. Equalization of power between the front wheels is accomplished by means of a conventional bevel gear differential located in one of the output shafts with drive to the differential being through a pinion gear keyed to an adapter sleeve serving as the axle center section input shaft. The front wheel drive system is easily converted into a four-wheel drive system by merely removing the adapter sleeve and inserting in its place a second differential of the worm gear type. By this arrangement input drive is then transmitted to the second differential with the drive divided by the worm gearing in such a manner as to have a portion directed to the first differential located on the center section output shaft and portion directed to a rearwardly extending propeller shaft for driving the rear wheels of the vehicle while still maintaining the desired low vehicle profile.

3,814,202

RACK AND PINION STEERING GEAR

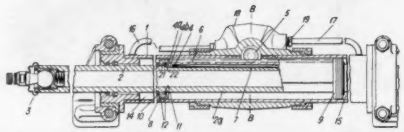
Harold Rushton, Preston, and Keith Blackledge, Longton, both of England, assignors to British Leyland Truck and Bus Division Limited

Filed Jan. 14, 1972, Ser. No. 217,773

Claims priority, application Great Britain, Jan. 20, 1971, 2772/71

Int. Cl. B62d *5/10*

U.S. Cl. 180—79.2 R **13 Claims**



In a rack and pinion steering unit the rack is formed in two parts and has a spring between the two parts so that the teeth of the rack are urged into engagement with the pinion.

3,814,203

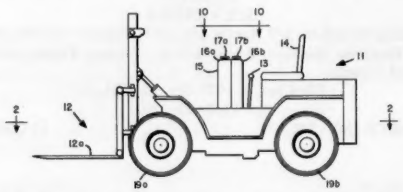
STEERING SYSTEM

Carl R. Gieszl, 1097 Muir Way, Los Altos, Calif. 94022

Filed Jan. 22, 1973, Ser. No. 325,755

Int. Cl. B62d *5/08*

U.S. Cl. 180—79.2 R **26 Claims**



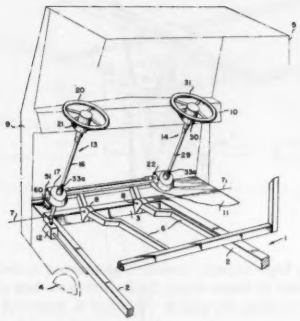
The steering system for each pair of steerable wheels in a motor vehicle includes a control valve to hydraulically connect a pressure fluid source to a steering linkage actuator for the pair of steerable wheels in the motor vehicle. A steering shaft with a laterally extending arm is provided to operate the control valve. The steering shaft extends into a rotatable housing member on which the control valve is mounted to move therewith. Coupling means is provided to connect the housing member to the steering linkage in order to turn and align the housing member around the steering shaft to correspond with the turning of the pair of road wheels. The steering shaft is urged by spring means to a position to close the control valve. A driver can operate a turning member to turn the steering shaft with respect to the housing member against the force of the spring means in order to steer the motor vehicle. Locking means is also provided to enable the pair of road wheels to be held in a fixed direction. For four wheels steering, two turning members can be closely positioned to enable a driver to determine and control the turned direction of each pair of road wheels by the use of one hand.

3,814,204

DUAL STEERING FOR TILT-CAB VEHICLE

Robert F. Larkin, Lincoln Park, N.J., assignor to Ecolotec Inc., Kenilworth, N.J.

Filed Aug. 21, 1972, Ser. No. 282,063
Int. Cl. B62d *1/22, 39/00*
U.S. Cl. 180—89 5 Claims



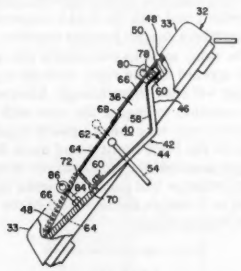
A dual steering conversion mechanism utilizing two gear means interconnected by an extensible rod positioned within a pivotally mounted cab-over-engine vehicle for alternative control from one of two positions within the cab. Steering torque generated at either position is delivered to the steerable wheels via a gear means which is slidably and pivotally connected to the cab, permitting the cab to be tilted forward.

3,814,205

INSTRUMENT PANEL COVER

Lyle Eugene Miller, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sept. 18, 1972, Ser. No. 289,990
Int. Cl. B60k *35/00*
U.S. Cl. 180—90 6 Claims



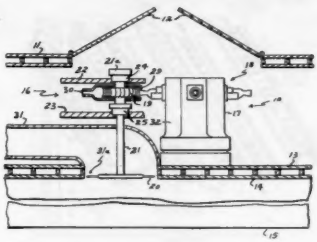
A generally rectangular instrument panel cover is pivotally connected at the lower edge of an instrument panel and is swingable to a closed position overlying the panel. Intermediate the top and bottom edges of the instrument panel cover, as considered when in its closed position, is a hinge joint which permits the top half of the panel cover to be pivoted to a parallel superposed position relative to the bottom half, both halves then being pivoted together to a lower stored position. The panel is apertured so as to receive locking means for receiving a padlock to lock the cover both in its closed and stored positions.

3,814,206

AIR GENERATING MECHANISM FOR AN AIRCRAFT AIR CUSHION TAKEOFF AND LANDING SYSTEM

Joseph E. Krysiak, 510 Wilmington Ave., Dayton, Ohio 45420

Filed Mar. 7, 1973, Ser. No. 338,728
Int. Cl. B60v *1/00*
U.S. Cl. 180—116 10 Claims



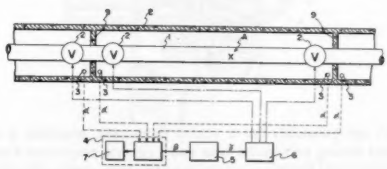
Air cushion-producing apparatus mounted within an aircraft and including an air inlet duct terminating in an open bottom portion with a drive fan positioned therewithin, a turbine interconnected with the fan through a common, rotatable supporting shaft, an inflatable air cushion-bag having its interior communicating with the open bottom portion and air inlet duct and suspended from, and providing the sole support to the aircraft during takeoff and landing, and a series of propellant-nozzle cartridges mounted for successive adjustment to a firing position, relative to the turbine, and ignitable to develop an impulse-producing thrust against, and thereby driving the turbine and its associated fan to pump an inflation-producing air flow into the air cushion-bag.

3,814,207

AN APPARATUS FOR DETECTING LEAK OF FLUID FROM A LONG PIPELINE FOR TRANSPORTING FLUID

Takazo Kusuda, Ibaraki, and Niichi Nishiwaki, Tokyo, both of Japan, assignors to Osaka Gas Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1972, Ser. No. 247,474
Claims priority, application Japan, Apr. 26, 1971, 46-27810; Dec. 8, 1971, 46-99737
Int. Cl. G01v *1/00*
U.S. Cl. 181—0.5 LD 13 Claims

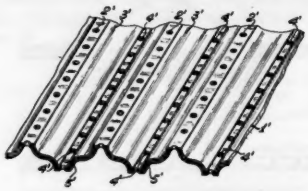


A system for systematically detecting a leak of fluid from a long pipe comprising a plurality of apparatuses like microphones set at relatively large intervals within a relatively long limited space, formed by utilizing the wall of the pipe like a space within the pipe and extending longitudinally of the pipe. The apparatuses intercept sonic waves caused by the leak of fluid from the pipe propagated in the limited space. The system further includes an apparatus for detecting that at least one first-mentioned apparatus has intercepted the sonic wave caused by the fluid leak.

3,814,208
SOUND-ABSORBING PANEL FOR AIR-CONDITIONING DUCTS AND THE LIKE

Nello Morresi, Via B. Cellini, 3, Milan, and Egidio Villa, Via Ampero, 49, Milan, both of Italy

Filed Jan. 10, 1972, Ser. No. 216,547
Claims priority, application Italy, Jan. 11, 1971, 19215/71
Int. Cl. E04b *1/84;* B32b *3/10*
U.S. Cl. 181—33 G **5 Claims**

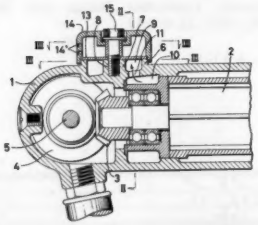


A panel for the guidance of an air flow comprises a body of sheet material provided on opposite sides with mutually offset nozzles in the form of hollow bosses or perforated ribs converging outwardly. The nozzles are formed by alternately bending the sheet material in opposite directions whereby a protuberance on one side corresponds to a depression on the other.

3,814,209
AIR EXHAUSTER FOR A ROTARY PNEUMATIC MACHINE

Katashi Inoue, Nara City, Japan, assignor to Fuji Kuuki Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1973, Ser. No. 323,081
Claims priority, application Japan, Jan. 24, 1972, 47-11254; Jan. 24, 1972, 47-11255; Jan. 24, 1972, 47-11256
Int. Cl. F01n *3/06*
U.S. Cl. 181—36 A **3 Claims**



An air exhauster for a rotary pneumatic machine is disclosed having an annular boss and a central projection having a tapped hole therein positioned on the body casing of a rotary pneumatic machine. An exhaust groove is formed between the boss and the central projection and a connecting hole is located at the bottom of said loop exhaust groove so that it can connect with an exhaust hole of an air motor fixed in the body casing. A partition board is located within the exhaust groove adjacent to said connecting hole, and an insulation board with an air hole is mounted on the upper edge of the loop boss. The outer side of said insulation board is covered by a bowl-shaped exhaust cover which has exhaust ports at one part of its periphery, and may be fastened by a single bolt which screws into the tap hole of said projecting navel.

3,814,210
ROPE CLIMBING DEVICE

Joseph J. Hoffman, Wichita Falls, Tex., assignor to Bear Manufacturing Corp., Wichita Falls, Tex.

Filed Feb. 5, 1973, Ser. No. 329,596
Int. Cl. A62b *1/14*
U.S. Cl. 182—6 **10 Claims**

A device to be used for ascending and descending on a rope, which rope is anchored near its upper end. A portion of the device which is attachable to the harness, as by a loop, is threaded laterally onto the rope and a holding member is rotated into position to prevent the rope from passing laterally outward therefrom. The portion of the device which attaches to the harness performs three functions; first, when the rope is passed around the friction members thereof, it will enable the controlled lowering of the climber from a upper elevation to a lower elevation, at a desired rate of speed or the climber may be stopped on the rope, or the descent thereon controlled by tensioning of the rope below the device; second, a brake is provided to which the body harness is so attached as to engage the brake member with the rope so as to hold the body against downward descent; third, with the rope passing longitudinally through the device attached to the harness, without engaging the friction members and with the brake suspending the body, foot engaging members may be hooked together, intermediate the length of the rope, so as to encompass the rope and upon raising the feet upward on the rope, without engaging a cam thereon, the rope will slide therethrough, however, by moving the feet to one position to engage the cam with the rope, the weight of the body may be pushed upward together with the device attached to the body harness and upon the climber attaining an upright position, the weight of the body is shifted so that the shoulder clamps will cause the brake member to engage the rope so as to enable the repeating of the movement to move the climber up the rope.

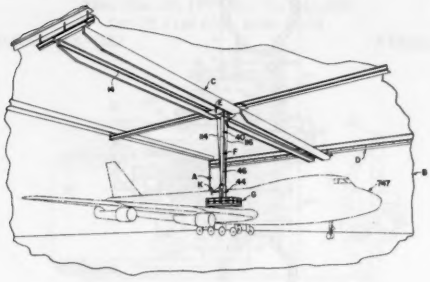
3,814,211
AIR SPACE VEHICLE SERVICING APPARATUS

Karl A. Pamer, Chagrin Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Mar. 1, 1972, Ser. No. 230,634
Int. Cl. E04g *3/10*
U.S. Cl. 182—14 **20 Claims**

Apparatus especially designed for use in servicing the exterior of air and/or space vehicles comprising a vertical oriented telescopic mast, the upper end of which is fixedly connected to a trolley movable linearly on an overhead bridge which bridge is movable on a suitable overhead runway. The lower end of the mast carries a personnel platform rotatably

connected thereto and which may include equipment usable in servicing an air or space vehicle. Movement of the bridge on the runway and the trolley on the bridge and extension and contraction of the mast is by power and the controls include



safety devices preventing collision between rigid parts of the apparatus and a vehicle which might result in damage to the vehicle. Provision is made for raising the personnel platform by power without reliance on the primary power supply.

3,814,212
WORKING OF NON-FERROUS METALS

Edwin J. Latos, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

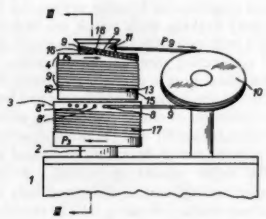
Filed May 12, 1972, Ser. No. 252,798
Int. Cl. F01m *1/00*
U.S. Cl. 184—1 E **9 Claims**

In the working of non-ferrous metals, particularly zirconium or alloy thereof or titanium or alloy thereof, the improved method of using a mono- or polyamine containing at least 12 carbon atoms as a lubricant.

3,814,213
ENERGY STORAGE DEVICE

Valentin Balass, Zurich, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed May 22, 1972, Ser. No. 255,384
Claims priority, application Switzerland, June 4, 1971, 8220/71
Int. Cl. F03g *1/00*
U.S. Cl. 185—39 **13 Claims**

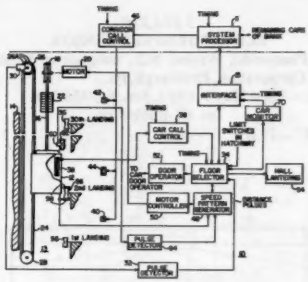


An energy storage device incorporating an energy storage element acting upon a power take-off element. The energy storage element is spanned between two movable supports which form the terminal elements of a transmission wherein the transmission ratio differs from 1:1 in at least one power transmission path section thereof.

3,814,214
ELEVATOR DOOR CYCLING CONTROL

Clyde A. Booker, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1973, Ser. No. 349,524
Int. Cl. B66b *13/22*
U.S. Cl. 187—29 R **12 Claims**

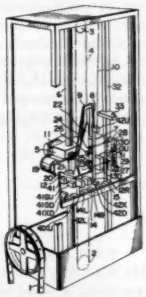


An elevator system including an elevator car mounted in a building to serve the floors therein. A car monitor is provided which is responsive to the operation of the car when it is stopped at a floor. The occurrence of an unusual condition which results in unnecessary cycling of the doors between their open and closed positions, results in corrective action being taken by the car monitor to stop the door cycling and to enable the car to leave the floor.

3,814,215
ELEVATOR CONTROL APPARATUS

Yoshinori Takahashi, and Masao Takizawa, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 4, 1973, Ser. No. 347,690
Claims priority, application Japan, Apr. 5, 1972, 47-33497
Int. Cl. B66b *1/52*
U.S. Cl. 187—29 R **5 Claims**



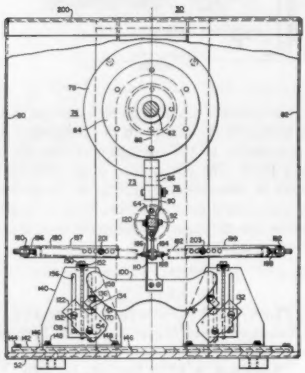
An elevator control apparatus comprising a synchronizer movable at a reduced speed proportional to the running speed of an elevator car, an advancer arranged for advancing movement on the synchronizer within a predetermined range for detecting a floor originating a call, and means for determining the running speed of the elevator car depending on the position of the advancer, hence the position of the floor orginating the call, relative to the position of the synchronizer, hence the floor position of the elevator car, when the advancer moves and stops at the position corresponding to the floor from which the call is originated. In the elevator control apparatus, a pre-advancer is additionally provided for making advancing

movement within a range outside the movable range of the advancer for detecting another floor originating another call so that it can detect calls originating from the range which is outside the detectable range of the advancer.

3,814,216
ELEVATOR SPEED SENSOR

Albert J. Pisatowski, Wayne, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 1, 1973, Ser. No. 356,268
Int. Cl. B66b *5/06*
U.S. Cl. 187—29 R **13 Claims**



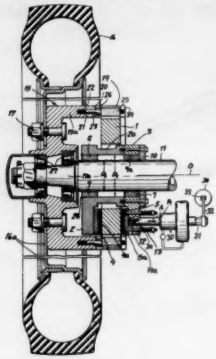
An elevator system including an elevator car mounted for movement in a building to serve the floors therein, including upper and lower terminal floors. The speed of the elevator car is checked or monitored at predetermined positions of the elevator car as it is approaching either terminal to insure that the car is slowing down within the limits of a predetermined deceleration schedule. A new and improved low inertia, fast acting car speed sensor insures that the speed indication used by the supervisory control is correct and timely at each car position check point, within a predetermined small tolerance.

3,814,217
ACTUATING MECHANISM FOR DISK BRAKE

Heinz Lochmann, Kuckucksweg 5, 6378 Oberstedten/Ts, Germany

Filed Jan. 24, 1973, Ser. No. 326,472
Claims priority, application Czechoslovakia, Apr. 21, 1972, 2711-72
Int. Cl. F16d *55/224*
U.S. Cl. 188—72.8 **4 Claims**

A movable brakeshoe, confronting a rotating brake disk, is shiftable in axial direction of the disk by the swinging of a lever in a plane parallel to the disk, the lever motion being translated into an axial displacement of a thrust rod by a screw coupling between the rod and a coaxial shaft rigid with the lever. The screw coupling includes a nut closed at one end and a bolt partly threaded into that nut from the other end, the projecting part of the bolt being shrouded by an annular chamber which receives lubricating oil extruded between the

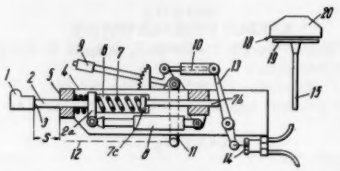


screw threads upon an inward movement of the bolt and feeds it back to the nut through a check valve upon an outward movement.

3,814,218
MECHANICAL OVERRUNNING BRAKING SYSTEM FOR TRAILERS OR THE LIKE

Herbert Merz, Pirolweg 1, 3 Hannover-Buchholz, Germany

Filed May 8, 1972, Ser. No. 251,092
Claims priority, application Germany, May 11, 1971, 2123373
Int. Cl. B60t *7/20*
U.S. Cl. 188—112 **18 Claims**



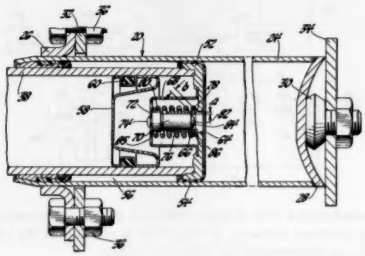
A mechanical overrunning braking system for trailers has main and auxiliary braking units which are mounted on the towed vehicle, at least two wheel brakes on the trailer, and cables or rods connecting the spreading levers or toggle leverages of the wheel brakes with the two units. Each wheel brake has two brake shoes one of which acts as a primary shoe in response to operation of one of the braking units while the brake drum rotates forwardly and the other of which acts as a primary shoe in response to operation of one of the braking units while the drum rotates rearwardly. A package of prestressed dished springs can be deformed only in response to operation of the auxiliary braking unit to thereby force the other shoe into frictional engagement with the drum. The characteristic curve of the springs is degressive or regressive, at least in the region corresponding to stressing of such springs beyond the initial stress. A force limiting device is installed between the main braking unit and the cables or rods to prevent the main braking unit from furnishing to the cables or drums a force which is sufficient to effect a deformation of springs to the extent which is necessary to move the other shoe into engagement with the brake drum.

3,814,219

ENERGY DISSIPATING UNIT

Wayne V. Fannin, and Harold E. Schultze, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1973, Ser. No. 345,890
Int. Cl. F16f 9/34; B60r 19/06
U.S. Cl. 188—282 5 Claims



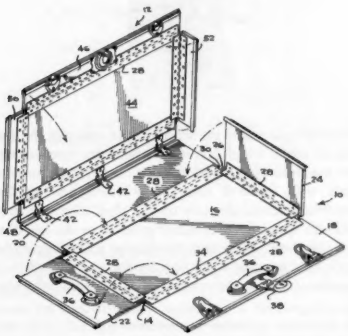
An energy absorbing bumper system for automotive vehicles includes a pair of fluid-filled telescopic cylinder units at respective ends of the bumper mounting the same to the vehicle chassis. Variable volume fluid chambers within each unit have the fluid flow therebetween controlled by a force magnitude controlling valve assembly including a pin with a tapered end proximate an orifice communicating the chambers and a compression spring-urged valve sleeve closing an annular gap between the tapered pin end and the edge of the orifice.

3,814,220

COLLAPSIBLE FOOT LOCKER OR TRUNK

Leo L. Brody, Memphis, Tenn., assignor to The Trojan Luggage Company, Memphis, Tenn.

Filed Mar. 15, 1972, Ser. No. 234,859
Int. Cl. A45c 7/00
U.S. Cl. 190—19 10 Claims



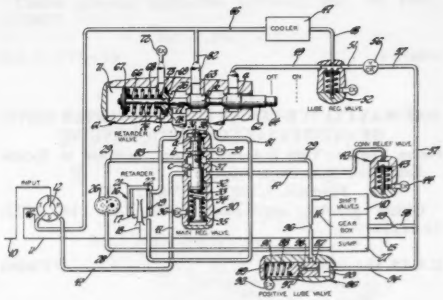
A collapsible trunk in which the walls of the lid and body are pivotally secured to the top and bottom panels respectively by a continuous flexible strip. The walls are secured to each other by rigid edge securing means in the form of angle irons. The trunk is knocked down by removing the corner angles and the angle irons that are held by the few bolts. The walls then pivot about the flexible strip to a planar position with their respective top or bottom panel.

3,814,221

TRANSMISSION WITH RETARDER AND CONTROL AND LUBRICATION SYSTEM

Reece R. Fuehrer, Danville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1972, Ser. No. 311,306
Int. Cl. F16d 67/04; F16h 47/08; F16d 33/12
U.S. Cl. 192—3.34 5 Claims



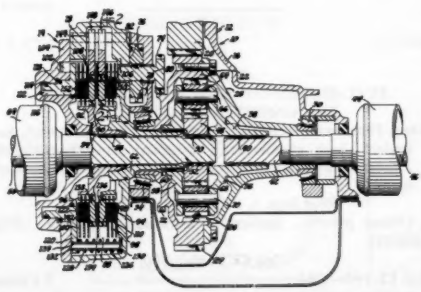
A transmission having a torque converter, a hydrodynamic retarder which pumps fluid from the inlet to the outlet and a power shift transmission and a control system having a high regulated main line pressure supplied to the transmission shift control with the overage fluid regulated at an intermediate pressure and connected through the converter and a cooler to the retarder and normal lubrication feed regulated at a low pressure. A manual retarder control valve operative in a retarder on position connects retarder and lubrication feed to the retarder inlet and the retarder outlet to the cooler inlet branch and cooler in a loop circuit back to the retarder feed for autocirculation by retarder pumping action. A positive lubrication supplemental feed valve is normally closed and operative in response to a lower less than minimum lubrication pressure in a signal and make up line opens to connect a restricted main line branch through the signal and make up line to provide supplementary lubrication feed to maintain minimum lubrication pressure. A one way valve prevents this supplementary lubrication feed flowing to the retarder inlet.

3,814,222

DIFFERENTIAL AND BRAKE ASSEMBLY WITH PARKING BRAKE FOR DIFFERENTIAL OUTPUTS

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1973, Ser. No. 327,707
Int. Cl. F16h 57/10
U.S. Cl. 192—4 A 4 Claims



A final drive differential and brake mechanism for a vehicle in which the differential has two outputs, one for each drive

axle, and a disc brake pack is arranged to brake both outputs to provide a service brake vehicle. In one embodiment, the outputs also have disc plates cooperating with pawls providing a parking brake arrangement. In another embodiment, the disc pack is mechanically actuated to provide a parking brake. The disc pack is liquid cooled and a cooling liquid pump is driven by the differential output through a gear arrangement which provides a stepped up speed for the pump.

3,814,223

ONE-WAY CLUTCH DEVICE FOR THE STARTER DRIVE OF AN INTERNAL COMBUSTION ENGINE

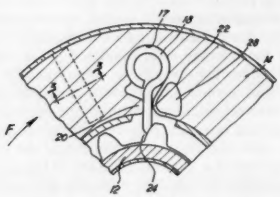
Pierre Toulier, Ville D'Avray, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Jan. 5, 1973, Ser. No. 321,182

Claims priority, application France, Jan. 14, 1972, 72.01218

Int. Cl. F16d *11/00*

U.S. Cl. 192—46 **7 Claims**



A one-way clutch device for the starter drive of an internal combustion engine. The one-way clutch comprise a driving ring and a driven ring concentrically arranged. The driven ring is provided with axial grooves, and the driving ring includes a substantially radial pawl retractably received in the grooves. The pawl is a strip-like element inserted in the driving ring and located between two abutments of elastomeric material, one abutment being substantially not deformable to hold the pawl in a substantially radial position within one groove, and the other abutment being resiliently deformable, enabling the pawl to move out of the groove, and returning said pawl to a radial position into cooperation with the groove when at rest.

3,814,224

FUEL-SUPPLY CONTROL FOR AUTOMOTIVE TRANSMISSIONS AND THE LIKE

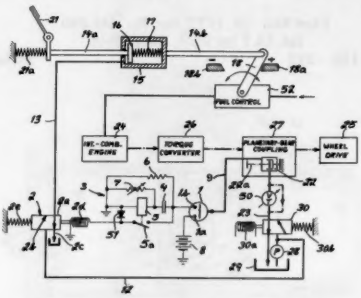
Klaus Podssuweit, Friedrichshafen, and Winfried Felder, Aulendorf, both of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Sept. 2, 1971, Ser. No. 177,320

Claims priority, application Germany, Sept. 19, 1970, 2046381

Int. Cl. B60k *21/00*

U.S. Cl. 192—.084 **7 Claims**



A drive-establishing clutch or brake of an automotive power train, actuated hydraulically upon a shifting into gear, is connected to a pressure-responsive switch which, upon attainment of a predetermined degree of hydraulic loading, closes a circuit for temporarily restricting the fuel supply to a carburetor or injection nozzle. The throttling of the fuel supply is terminated either after a predetermined period, as measured by a time-constant network, or upon full activation of the clutch or brake, as determined by a speed detector.

3,814,225

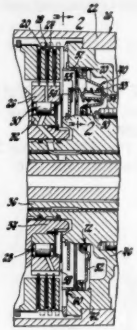
PISTON ASSEMBLY FOR POWER TRANSMISSION

James R. Martin, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1973, Ser. No. 337,627

Int. Cl. F16d *25/00*

U.S. Cl. 192—85 AA **5 Claims**



This piston assembly incorporates an annular shell stamped from sheet metal which has inner and outer rims connected by an intermediate channeled portion. Inner and outer annular lip seals with integral retainer portions are molded from elastomeric material directly on the shell adjacent to the rims to eliminate special seal retainer grooves or the bonding of the seals to the shell. The outer rim has an axially extending contact face for engaging a friction device and radially extending stop means to limit movement of the piston into the piston bore.

3,814,226

CLUTCH PISTON ASSEMBLY HAVING UNITARY ELASTOMERIC CUSHION RING AND LIP SEAL

Charles R. White, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

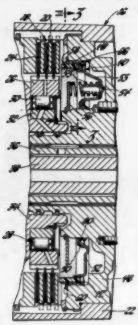
Filed Mar. 19, 1973, Ser. No. 342,514

Int. Cl. F16d *25/00*

U.S. Cl. 192—85 AA **5 Claims**

This piston assembly for selectively engaging a friction drive establishing device incorporates an annular sheet metal shell

which has inner and outer rims connected by an intermediate channel portion. There is a one-piece elastomeric cushion ring and lip seal unit molded directly on the shell adjacent to the outer rim. The cushion ring and lip seal are disposed on opposite sides of the shell and are joined by connector portions



extending through openings therein. As the piston assembly strokes in its bore the cushion ring initially engages the friction device and deflects to accumulate apply force to cushion the subsequent engagement of the piston with the friction device and to calibrate the torque capacity of the friction device.

3,814,227

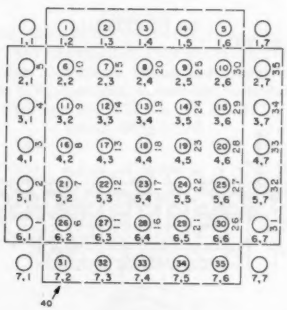
MATRIX PRINT ROTATION

Edward T. E. Hurd, III, Cinnaminson, N.J., and David M. Stern, Merion Station, Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 27, 1972, Ser. No. 292,618

Int. Cl. B41j *3/50*

U.S. Cl. 197—1 R **10 Claims**



A printer using a matrix of printing elements arranged in a square configuration with the printing elements being used to print alpha-numeric data in either a vertical or horizontal orientation by electronically selecting a rectangular matrix from less than the full number of printing elements in the square matrix to permit selective orientation of the printed data without mechanically reorienting the print head. The print element drive circuitry also enables the printing matrix to print from either end of the selected rectangular print matrix in either the horizontal or vertical orientation to provide four possible orientations of the printed alpha-numeric data. A memory is used to store the input control signals for each of the rows of the rectangular printing matrix while a control means is provided for reading out the control signals in either direction from the memory in combination with a matrix selection control to provide energization of a rectangular print matrix in either the horizontal or vertical configuration.

3,814,228

REPEAT MECHANISM FOR A PRINTER

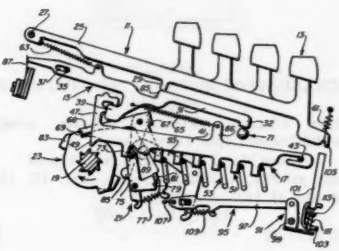
Rudolf Blum, Nuernberg, Germany, assignor to Triumph Werke Nuernberg A.G., Nuernberg, Germany

Filed Nov. 21, 1972, Ser. No. 308,554

Claims priority, application Germany, Nov. 29, 1971, 2159071

Int. Cl. B41j *5/22*

U.S. Cl. 197—16 **8 Claims**



A type action of a single element printer is provided with a repeat mechanism which enables each type key to effect repeated printing of a corresponding type character. The depression of a selected type key initiates the operation of a character selection mechanism which determines the orientation of the print element to print the selected type character and at the same time operates a control means to enable a rotatable coupling means to cyclically drive the print element in an orienting movement to the orientation determined by the character selection mechanism and in a printing movement to impact the selected type character against a recording medium. The cyclical driving movement is determined by a camming surface on the rotating coupling means which operates on the control means at the end of the cycle so as to stop the rotational movement of the coupling means and conclude the printing operation. Repeated printing of the selected type character is effected by a repeat mechanism which operates upon the further depression of the type key to retain the control means in the actuated position so as to continue the rotational movement of the coupling member.

3,814,229

DATA OUTPUT PRINTER

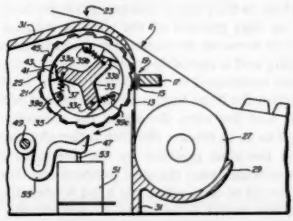
Hermann Kohlhage, Nuremberg, Germany, assignor to Triumph Werke Nuremberg A.G., Nuremberg, Germany

Filed Apr. 21, 1972, Ser. No. 246,260

Claims priority, application Germany, June 19, 1971, 2130566

Int. Cl. B41j *23/04*

U.S. Cl. 197—18 **3 Claims**



Rotatably driven type wheels carrying type characters on the periphery thereof are supported resiliently about a normal

operating axis for movement to a printing position to impact a selected type character against a recording medium. The movement of the type wheel to the printing position is accomplished by engaging a relatively stationary stop member with an abutment on the type wheel to stop the normal rotational movement of the type wheel and enable the associated rotational kinetic energy to pivot the type wheel about the stop member to impact the selected type character against the recording medium at the printing position. To ensure full engagement of the stop member with the abutment on the type wheel and reduce the accompanying stresses, the stop member yieldably engages the abutment prior to stopping the normal rotational movement of the type wheel.

3,814,230

MECHANISM FOR MOVING A PRINTING HEAD IN A PRINTER

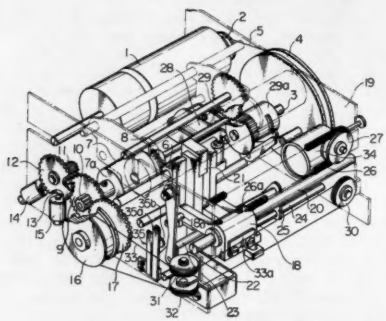
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Kabushikikaisha Copal, Tokyo, Japan

Filed Mar. 22, 1973, Ser. No. 343,640

Claims priority, application Japan, Apr. 18, 1972, 47-045904; Apr. 18, 1972, 47-045905

Int. Cl. B41j *19/00*

U.S. Cl. 197—60 **2 Claims**



Mechanism for moving a printing head in a printer. The printing head is mounted on a head holder movable between a start position and a terminal position for the printing operation and the head holder is urged by a spring toward the start position. A winding drum is driven by an electromagnetic clutch through reduction gearing and the clutch is in turn releasably driven by an electric motor through a control circuit adapted to supply a signal to the clutch to release the same. An endless belt is stretched around the winding drum and pulley means so as to be driven by the drum. A portion of the wire stretched between the pulley means extends in parallel and close to the path of movement of the head holder and a portion on that portion of the wire is secured to the head holder so as to move the same with the movement of the wire. A detecting coil is operably coupled with the electro magnetic clutch and connected to the control circuit so that, when the clutch drives the head holder to the terminal position through the drum and the wire, the signal for releasing the clutch is generated so as to release the clutch thereby moving the head holder to the start position by the action of the spring. A switch is provided near the start position and connected to the control circuit so that, when the head holder reaches the start position, the switch is actuated to actuate the electro-magnetic clutch through the control circuit thereby moving the head holder toward the terminal position for the printing operation of the printing head.

3,814,231

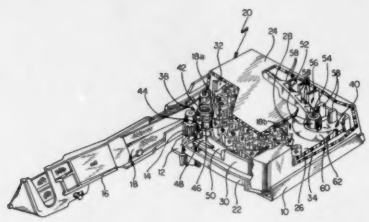
STUFFED RIBBON CARTRIDGE

Samuel D. Cappotto, Syracuse, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Apr. 24, 1973, Ser. No. 354,056

Int. Cl. B41j *33/10*

U.S. Cl. 197—168 **12 Claims**



A shroud is positioned near the exit area of a stuffed ribbon cartridge for a typewriter or similar machine to prevent more than one strand of a ribbon from being withdrawn from the storage chamber of the cartridge at a time. The shroud is a ridge on the floor of the storage chamber with the distance from the top of the ridge to the ceiling less than the width of the ribbon. The shroud is formed around the exit area in an arc shaped so that the single strand of ribbon being withdrawn from the storage chamber will cross the shroud substantially at right angles to the shroud from any direction that it is pulled from inside the storage chamber.

3,814,232

CONTAINER HANDLING MACHINE

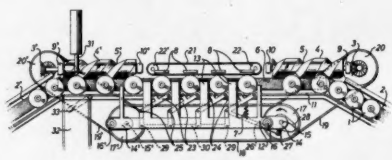
Karl Erik Ingemar Eriksson, Box 6001, S-700 06, Orebro, Sweden

Filed Dec. 15, 1972, Ser. No. 315,774

Claims priority, application Sweden, Dec. 15, 1971, 16042/71

Int. Cl. B23q *5/14*

U.S. Cl. 198—19 **8 Claims**

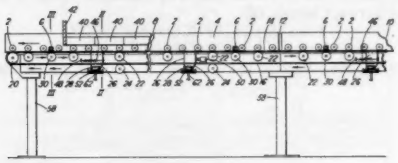


This invention relates to a machine for feeding a series of containers, such as glass bottles, in a step-by-step manner between a number of stations along a straight path. The machine comprises a carrier consisting of a number of carrier fingers projecting outwardly from a common longitudinal bar perpendicular thereto. The bar extends parallel to said path and is arranged to carry out a continuous parallel movement around a circular loop. The machine further comprises two conveying screws arranged at respective ends of said path, one screw being arranged to feed the containers one by one to the input position of the carrier and the other screw being arranged to carry away the containers arriving at the output position of the carrier, both conveying screws being driven in timed relation to the carrier.

3,814,233
CONVEYORS

Rowland J. J. De Courcy, Basingstoke, England, assignor to Douglas-Rownson Limited, Basingstoke, England

Filed Nov. 30, 1972, Ser. No. 310,897
Claims priority, application Great Britain, Dec. 6, 1971, 56544/71
Int. Cl. B65g 13/02
U.S. Cl. 198—127 R 8 Claims

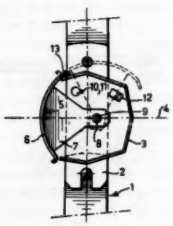


A roller conveyor of the kind in which rollers are free to turn between side members and are driven by means of an endless driving belt or the like which engages the undersides of the rollers is so constructed that at least one group of rollers together with the supporting side members form a unit mounted for movement in a generally horizontal plane in a direction opposite to the direction of conveying against a resilient biasing force, movement in this direction in excess of a predetermined amount serving to actuate a control member to operate an independently powered mechanism for separating the rollers of the unit from the driving belt or the like so that the frictional drag is completely removed. The independently powered mechanism preferably lifts the unit as a whole to separate the rollers from the driving belt and may be pneumatically operated, the control member controlling the flow of compressed air to the mechanism.

3,814,234
DEVICE FOR TREATING CONTAINER-PACKED WARES AND CONVEYING UNIT FOR SUCH A DEVICE

Salomon Santen, Amsterdam, Netherlands, assignor to Stork Amsterdam N.V., Sportlaan, Amstelveen, Netherlands

Filed Sept. 26, 1972, Ser. No. 292,422
Int. Cl. B65g 17/12
U.S. Cl. 198—143 3 Claims

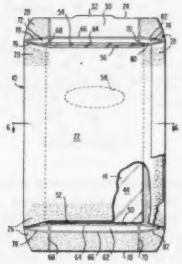


A conveyor for a continuous sterilizer, said conveyor comprising two parallel chains with a number of gutter shaped carriers each having a C-cross-section with a longitudinally extending opening; each carrier has a movable cover with locking means for retaining the cover in its closed and its open position.

3,814,235
HOSIERY PACKAGE

John W. Glaze, Jr., Charlotte, N.C., assignor to Intech Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 177,228, Sept. 2, 1971, Pat. No. 3,768,226. This application Nov. 16, 1971, Ser. No. 199,105
Int. Cl. B65d 5/50, 85/18
U.S. Cl. 206—45.14 22 Claims

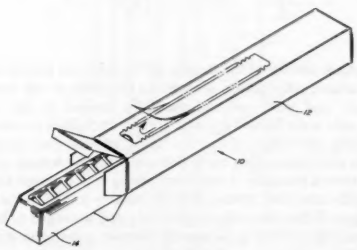


An improved package for hosiery articles and the like comprising a generally flat rectangular outer body envelope and a flattened tubular liner attached to the inside of the outer body in such a manner as not to inhibit flexing of the outer body or the liner to enable them to receive the article. The liner is of lesser width than the outer body to confine the article so it remains in position beneath an inspection window formed in the outer body. The outer body can be provided with a closure flap and a shortened back panel, so that a portion of the article can be folded over the panel and grasped between the closure flap and the panel to hold the article firmly in position.

3,814,236
DISPENSING CONTAINER

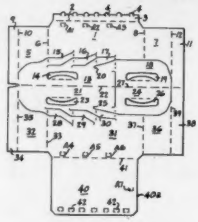
Michael R. Keilman, Algonquin, Ill., assignor to Baxter Laboratories Inc., Morton Grove, Ill.

Filed Aug. 21, 1972, Ser. No. 282,512
Int. Cl. B65d 1/36
U.S. Cl. 206—72 5 Claims



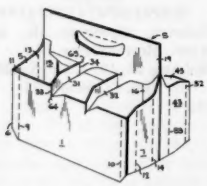
The present application discloses a dispensing container for supporting therein a tray providing structure for supporting a plurality of elongated bands. The container includes a dispensing opening through which one-by-one the bands may be removed.

3,814,237
ARTICLE CARRIER
Homer W. Forrer, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 5, 1971, Ser. No. 195,976
Int. Cl. B65d *75/00, 5/48*
U.S. Cl. 206—167 **3 Claims**



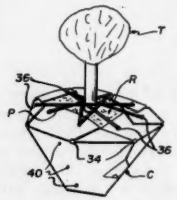
A basket style article carrier having side and end walls and an initially open bottom wall is moved continuously after being moved into enveloping relation with respect to a continuously moving group of articles by loading the articles into the carrier through the bottom. The carrier is provided with one or more registering apertures in its side and bottom walls, the registering apertures being disposed to engage synchronous machine elements which enter these apertures and serve to maintain the carrier side walls in transverse alignment and also to maintain the bottom wall in a desired positional relationship relative to the side walls so as to condition the carrier for closing its bottom wall.

3,814,238
ARTICLE CARRIER
Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 5, 1971, Ser. No. 196,110
Int. Cl. B65d *75/00*
U.S. Cl. 206—167 **1 Claim**



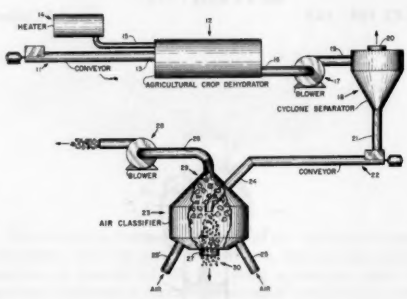
An article carrier of the basket style comprises medial handle structure, riser panels secured to the ends of the handle structure, end walls secured medially thereof to the riser panels, side walls foldably joined at their end edges to the corresponding end edges of the end walls, at least one partition element interconnecting each side wall and the handle structure to form a plurality of article receiving cells on each side of the handle structure, bottom panels foldably joined to the bottom edges of the side walls respectively and arranged to be interconnected to form a composite bottom panel, the dimensions of the cells on each side of the handle structure in a direction longitudinally of the carrier being less than the diameters of the packaged articles so that the sum of the diameters of the articles packaged and of the partition elements in each row of cells is greater than the length of the handle structure and of each side wall. The carton is formed completely except for the composite bottom panel and is lowered from above into enveloping relationship relative to a group of articles to be packaged, the articles having upwardly tapered upper portions to facilitate loading and preferably the partition elements being extensible whereby relative movement in a direction which is transverse to the carrier handle is accommodated between the side walls and the handle structure to facilitate manual access to a hand gripping opening formed in the handle structure.

3,814,239
TREE ROOT CONTAINER
Patrick McGinley, Geigertown, and Santo J. Formica, King of Prussia, both of Pa., assignors to Container Corporation of America, Chicago, Ill.
Filed May 15, 1972, Ser. No. 253,112
Int. Cl. A01g *23/04;* **B65d** *5/02, 85/52*
U.S. Cl. 206—423 **2 Claims**



A collapsible, inverted, generally frusto-conical container, formed from a unitary blank of paperboard, for enclosing a tree root ball to facilitate transplanting.

3,814,240
SEPARATION OF THERMOPLASTIC FILM AND WASTEPAPER
James F. Laundrie, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Sept. 13, 1972, Ser. No. 288,761
Int. Cl. B07b *13/00*
U.S. Cl. 209—11 **3 Claims**

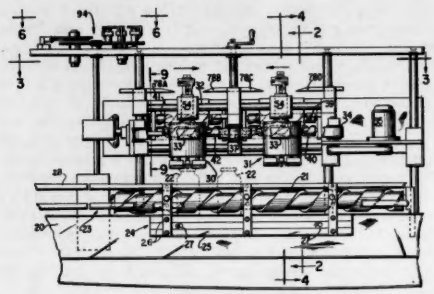


A process of transporting, in suspension, a mixture of *wastepaper and thermoplastic* film in a hot gas stream causing the thermoplastic film to contract upon itself and form particles, thereby decreasing its specific surface to such an extent as to allow removal of the contracted plastic particles from the mixture by standard mechanical methods, such as air classification or screening. The process effectively removes all thermoplastic film from the wastepaper thus allowing for more efficient paper utilization through higher recycling rates.

3,814,241
OPPOSITELY RECIPROCATING CONTAINER INSPECTING MACHINE

David F. Sklar, deceased, late of Kent Cliffs, Putnam County, N.Y., by Frances S. Stein, 120 Chestnut Rd., Manhasset, N.Y. 11030

Filed Feb. 2, 1973, Ser. No. 329,053
Int. Cl. B07c 5/00
U.S. Cl. 209—80 8 Claims

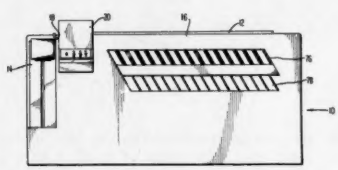


A machine and method for inspecting and sorting glass bottles or containers wherein there are at least a pair of oppositely reciprocating testing heads. The testing heads have control circuits for ejecting unacceptable bottles or containers.

3,814,242
AUTOMATIC ARTICLE SORTING MACHINE

John W. Dillard; Dominick Tringali; Richard L. Swartz, and Ernest M. Hinson, Jr., all of Columbia, S.C., assignors to Universal Business Machines, Incorporated, Columbia, S.C.

Filed June 15, 1973, Ser. No. 370,415
Int. Cl. B07c 5/342
U.S. Cl. 209—111.7 16 Claims

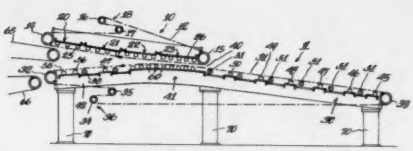


An automatic sorting machine for automatically sorting record receivers according to the elapsed time data printed thereon and for automatically punching the record receivers in accordance with printed time of day data appearing on the receivers. The machine includes apparatus for serially feeding record receivers to a scanning station having three scanning heads mounted to scan and convert printed data into radiant energy pulses that are analogues of the data. The pulses are sensed and converted to elapsed time and time of day BCD (Binary Coded Decimal) analogues. The elapsed time BCD analogues are applied as inputs to elapsed time error checking and correction logic which automatically corrects for error appearing in the printed data on the record receiver to generate elapsed time signals. The elapsed time signals are applied by electronics to selectively operate gate solenoids related to specific record receiver storage bins in the sorting machine. The time of day BCD analogues are applied as inputs to time of day error checking and correction logic which provides time of day signals corrected as stated above to selectively energize punch solenoids. The punch solenoids are energized by the signals while the record receivers are at the scanning station after which the record receivers are released to be automatically transported by the machine and stored in the bins selected by the elapsed time data. All logic is automatically restored in timed sequence with machines' rate capability for storing documents.

3,814,243
MAGNETIC SHEET CLASSIFIER

Paul W. Miller, Warren, Ohio, assignor to Wean United Inc., Youngstown, Ohio

Filed May 10, 1972, Ser. No. 251,938
Int. Cl. B03d 1/22
U.S. Cl. 209—223 A 7 Claims

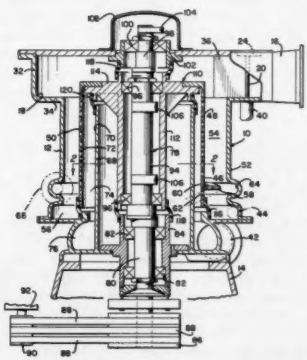


A magnetic classifier for flat ferrous sheets comprising upper and lower conveyors, the lower conveyor having a sheet-receiving portion and a sheet-exiting portion and an intermediate portion wherein a plurality of electromagnets are supported along a curved path longitudinally of the reach of the belt of the lower conveyor. The belt reach follows this curved path and, when the electromagnets are energized, the sheet is attracted to the belt reach and longitudinally curved to correspond to the curvature of the path. The curvature of the path is in an amount that would not bend the sheet beyond its elastic limit, so that the sheet will resume its flat condition when it is moved by the belt reach beyond the curved path.

3,814,244
APPARATUS FOR FRACTIONATING FLUID SUSPENSIONS

Douglas L. G. Young, Pierrefonds, Quebec, Canada, assignor to Canadian Ingersoll-Rand Company Limited, Montreal, Quebec, Canada

Filed May 30, 1972, Ser. No. 257,767
Int. Cl. C10g 31/14
U.S. Cl. 209—273 19 Claims



Fractionating apparatus comprising a plurality of annular walls spaced one inside the other, at least one of which walls is a screen. The apparatus includes rotary drive shaft means having a portion connectible to a driving means and a portion eccentric to such connectible portion; and one of the annular

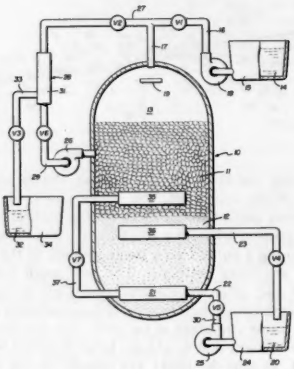
walls is connected to the eccentric portion of the drive shaft means to be orbitally driven during the driven rotation of the drive shaft means.

3,814,245

METHOD OF FILTERING

Gene Hirs, Birmingham, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Aug. 21, 1972, Ser. No. 282,518
Int. Cl. B01d *41/02*
U.S. Cl. 210—74 **4 Claims**



A liquid filtering method for operating an apparatus comprising a deep bed of dual, vertically separate, granular filter media beds. The first filter media bed has relatively coarse, light grains, e.g. in a size range of 0.050 to 0.375 inches and having a specific gravity in the range of 0.9 to 1.6. The second filter media bed, which underlies the first bed, has finer, heavier grains which have a specific gravity greater than 2.1. During filtration, after flow downwardly through the first bed, a substantial portion of the partially filtered liquid is intercepted and directed upwardly through the second bed to a clean liquid outlet located within the depth of the second bed. The remainder of the partially filtered liquid continues to flow downwardly into and through the second bed to the same outlet. Upon backwashing, the first bed is slurried and turbulently recirculated through a path external of the retaining vessel, while the second bed is only expanded. After backwashing, the filter media beds assume their original respective orientations.

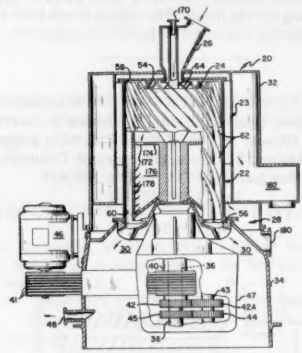
3,814,246

METHOD FOR CENTRIFUGALLY REMOVING LIQUID FROM A MIXTURE

Peter C. Wilson, Evergreen, and Robert P. Hughart, Englewood, both of Colo., assignors to Fiberfuge Company, Denver, Colo. and Centrifugal and Mechanical Industries, Inc., St. Louis, Mo., a part interest to each

Division of Ser. No. 752,022, Aug. 12, 1968, Pat. No. 3,642,139. This application Aug. 20, 1971, Ser. No. 173,657
Int. Cl. B04b *3/04*
U.S. Cl. 210—78 **13 Claims**

A method and apparatus for continuously removing, through a centrifuging operation, liquid from a mixture including therein a cellulose fiber pulp of organic origin which is used or could be used in the making of paper. The method involves impinging the mixture upon a rotating screen surface to form a layer of lightly compacted, relatively porous, fibrous material thereon and passing a portion of liquid through said porous layer of material and through said screen followed by effecting a further removal of the liquid from said mixture by cleaning said screen surface by moving the edge of a transportating member adjacent said screen surface while simultaneously producing and maintaining a mass of densely compacted, relatively impervious, fibrous material between said edge and said screen and using said mass to remove continuously from said screen surface fibrous material deposited thereon, and rolling, wringing and redepositing said fibrous material upon said screen surface while passing additional liquid through said screen and moving said fibrous material along said screen surface. The mixture is centrifuged at a force varying within a range between approximately 70 and 650 times the force of gravity. The fibrous material passing with the liquid through the screen is recovered by impinging the liquid-fibrous material upon the surface of a second screen. The method may also be used with a mixture containing fibers which are relatively short in length by adding to said mixture a predetermined quantity of fibers having a relatively long length. The apparatus comprises a hollow, rotatably mounted screen means, a scroll member rotatably mounted concentrically within said screen means, and means for rotating the

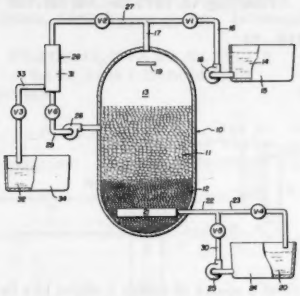


scroll member at a predetermined angular velocity differential relative to the angular velocity of rotation of the screen means. The screen means preferably has a circularly shaped inner surface and a plurality of openings formed therethrough, the minimum dimension of said openings, taken in a direction generally normal to the longitudinal axis of said openings, varying within a range of not less than approximately 0.3 millimeters nor more than approximately 3 millimeters. The scroll member has a plurality of helical flights formed on the surface thereof so constructed and arranged to prevent fibrous material from "bridging" between adjacent flights. This construction and arrangement includes helical flights disposed to form an included angle with a plane disposed perpendicular to the longitudinal axis of the scroll member not more than approximately 65°, and perpendicularly spacing each flight from an adjacent flight by an amount equalling at least approximately 0.03 and preferably 0.04 times the inner circumference of the screen means. The clearance between the edge of each flight and the inner surface of the screen means adjacent the end into which the mixture is supplied to the apparatus equals approximately not more than 0.004 times the inner diameter of the screen means. A relationship exists between certain structural parts of the apparatus whereby, upon operation thereof, the fibrous material is retained upon the inner surface of the screen means at least approximately 1½ seconds and preferably about 3 seconds.

3,814,247
METHOD OF FILTERING

Gene Hirs, Birmingham, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Aug. 21, 1972, Ser. No. 282,520
Int. Cl. B01d 41/02
U.S. Cl. 210—80 1 Claim

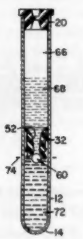


A liquid filtering method for operating an apparatus comprising a deep bed of dual, vertically separate, granular filter media beds. The first filter media bed has relatively coarse grains - being in the size range of 0.050 to 0.375 inches — which have a specific gravity in the range of 0.9 to 1.6. The second filter media bed, which underlies the first bed, has finer grains which have a specific gravity greater than 2.1. Upon backwashing, the first bed is slurried and turbulently recirculated through a path external of the retaining vessel, while the second bed is only expanded. After backwashing, the filter media beds assume their original respective orientations.

3,814,248
METHOD AND APPARATUS FOR FLUID COLLECTION AND/OR PARTITIONING

Creighton M. Lawhead, Corning, N.Y., assignor to Corning Glass Works, Inc, Corning, N.Y.

Continuation-in-part of Ser. No. 178,274, Sept. 7, 1971, abandoned. This application Feb. 23, 1972, Ser. No. 228,573
Int. Cl. B01d 21/26
U.S. Cl. 210—83 22 Claims



Spools or partitioning assemblies, utilized with rigid tubular containers (adapted to serve as fluid specimen collection or fluid-retaining tubes), for effecting either the physical or the complete physical and chemical partitioning of the heavier fluid phase from the lighter fluid phase of a centrifugally separated fluid specimen, wherein each spool has a central axial orifice and a resilient annular wiper portion, including a container-contacting surface, adapted to sealingly engage the inner surface of the container, as well as an integral annular skirt portion, with the tapering inner surface of the latter serving as a continuation of the spool central axial orifice. The spools, by having specific gravities that are intermediate of those of the separated fluid phases, are adapted to move downwardly in the tubular containers in response to centrifugal force, only to the vicinity of the fluid phase interface, with the lighter fluid phase flowing freely upwardly only through the central axial orifice. Physical partitioning may be effected by the combination of a spool or spool-diaphragm in conjunction with a natural plug of the heavy phase fluid, with this plug making at least a continuous network across the central orifice and thereby retaining the heavy fluid phase from passing through the orifice. Complete physical and chemical partitioning is effected by the combination of a spool and float member, with the latter, by also having a specific gravity intermediate those of the separated phases, being adapted to make at least a continuous line contact seal on the inner surface of the spool skirt portion. The partitioning assemblies may be utilized in closed-system (evacuated) fluid collection tubes or may be user-inserted into opened (atmospheric pressure) tubes after specimen collection.

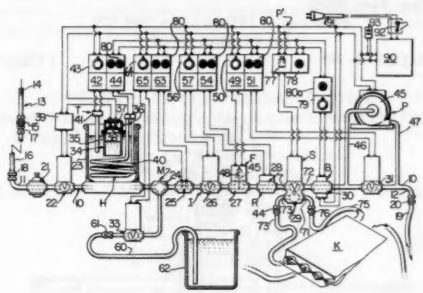
One method of effecting complete physical and chemical partitioning of the lighter and heavier fluid phases involves freely disposing a float member within the container; providing the container with a spool that is in continuous sealing contact with the inner surface of the container; moving the spool downwardly therein in response to a centrifugal force, thereby establishing an upward flow of the lighter fluid phase only through the spool central axial orifice; and establishing a continuous line contact seal between the float member and the spool central orifice when the spool reaches the fluid phase interface.

Other methods include the physical partitioning of the heavier fluid phase from the lighter fluid phase.

3,814,249
DIALYSIS APPARATUS

Thomas E. Eaton, Hawthorne, Calif., assignor to Eaton Medical Electronics, Inc., Lawndale, Calif.

Division of Ser. No. 40,244, May 25, 1970. This application Apr. 12, 1972, Ser. No. 243,286
Int. Cl. B01d 31/00, 13/00
U.S. Cl. 210—86 16 Claims



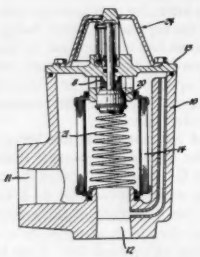
A dialysis apparatus comprising an elongate flow passage with inlet and outlet ends; valve controlled re-circulating pump means at the outlet end of and establishing a minus pressure in the passage and maintaining the flow of fluid therethrough; a water reservoir with heater means at the inlet end of the flow passage; brine concentrate supply and mixing means communicating with the flow passage downstream of the reservoir; fluid by-pass means in the flow passage downstream of the reservoir and connected with a Kiil device; salinity, flow rate and pressure monitoring means in the flow passage between the brine concentrate supply and mixing means and the fluid by-pass means; valving means related to the monitoring means, blood leak detecting means in the flow

passage downstream of the by-pass means and automatic controls for the valving means and responsive to the monitoring and detecting means.

3,814,250
POWER TRANSMISSION

Robert H. Mezger, Livonia, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Sept. 29, 1972, Ser. No. 293,628
Int. Cl. B01d *27/10*
U.S. Cl. 210—90 **1 Claim**

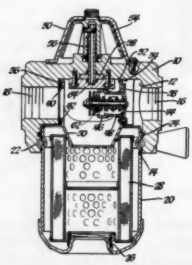


A filter includes a cylindrical filter element which is arranged to normally have fluid pass therethrough. A linear bypass valve opens in response to a predetermined pressure drop through the filter element and operates an indicator when the valve is open. A spring within the filter element and supported thereby holds the valve closed at other times. A second spring opens the valve when the filter element or the spring or both are omitted, thus causing the indicator to be shifted in the same manner as when the pressure drop across the element is too high.

3,814,251
POWER TRANSMISSION

Ronald A. Aspinwall, Detroit, and MacKellar K. Graham, Birmingham, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Aug. 9, 1972, Ser. No. 279,123
Int. Cl. B01d *35/14*
U.S. Cl. 210—90 **1 Claim**

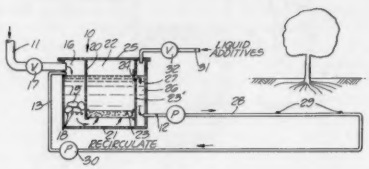


A fluid filter has a body with a central cavity open at the bottom to receive a cup containing a cylindrical filter cartridge and having inlet and outlet terminals, one of which opens to the cavity and the other opens to the interior of a fluid directing member opening at its bottom to the interior of the filter cartridge. A normally closed bypass valve is mounted in one wall of the fluid directing member and actuates a rotary indicator mounted on the top of the body. The indicator shaft is sealed against fluid pressure inside the body. The body is preferably a machined casting and the flow directing member preferably is formed from sheet metal.

3,814,252
FILTER APPARATUS

Atwood M. Timpe, 535 S. Curson Ave., Apt. 7B, Los Angeles, Calif. 90036

Filed Aug. 18, 1972, Ser. No. 281,705
Int. Cl. B01d *35/02*
U.S. Cl. 210—94 **9 Claims**

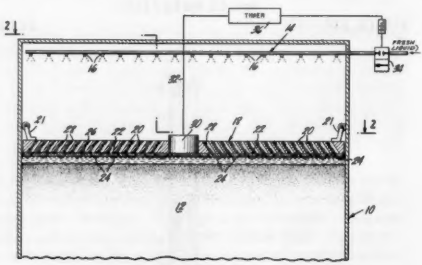


Water from a source of supply is added to a first chamber and via an exit opening in the lower part of the first chamber it wells upwardly into a second chamber through a filter element. Water from the second chamber overflows on the filtered side through a fine screening element into a third chamber of lesser volume having outlet means interconnecting with utilization pipes or tubing, and further inlet means via which such things as fertilizer or the like may be admixed with the water. A lower sidewall of the second chamber located below the filter element is pivotable to the open position enabling removal of sediment by the pressure of water entering from the first chamber above.

3,814,253
LIQUID CONTROL APPARATUS FOR CHROMATOGRAPHY COLUMNS

K. Holger Forsberg, Sokenteltdas, Kotka, Finland

Continuation of Ser. No. 185,548, Oct. 1, 1971, abandoned.
This application Mar. 26, 1973, Ser. No. 345,234
Int. Cl. B01d *15/08*
U.S. Cl. 210—97 **16 Claims**



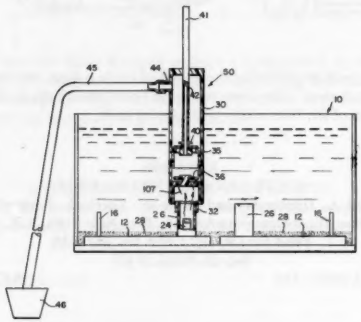
Flow control apparatus for a chromatographic fractionating column includes a liquid-pervious plate assembly adapted to float on the liquid layer overlying an ion exchange resin bed within the column and a detection device carried by the assembly responsive to the thickness of the liquid layer reaching a predetermined minimum for opening a normally closed valve to supply additional liquid to the column so as always to maintain a liquid cover over the bed. The minimum thickness of the liquid layer is such that the underside of the plate assembly, formed in part by an open-mesh net, penetrates the upper surface of the bed, thereby periodically smoothing out

irregularities. A timer holds the valve mechanism open until sufficient liquid has been added to refloat the plate assembly. The plate assembly is formed with a multiplicity of holes of a cross-sectional size and obliquity to the vertical such that the liquid, added to the column from above, cannot impact directly on the resin bed surface.

3,814,254
AQUARIUM CLEANSING APPARATUS

Peter M. Schatz, 8440 Evergreen Ave., Indianapolis, Ind. 46240

Filed Oct. 18, 1972, Ser. No. 298,779
Int. Cl. E04h *3/20;* **B01d** *23/10*
U.S. Cl. 210—169 **9 Claims**



Apparatus for maintaining a clean environment in an aquarium. A false bottom having a perforate top and defining an open flow space thereunder is placed in an aquarium and is covered with a layer of gravel. An air-lift pump continuously pumps water out of the flow space and thereby circulates water downward through the gravel, and the gravel acts as a filter bed to collect wastes. A standpipe integral with the false bottom forms part of the air-lift pump and defines an open flow channel of large capacity from beneath the false bottom through the filter bed. Periodically, e.g., once a week, water is discharged from the tank through the standpipe, preferably with a piston pump, so as to produce a strong pulsating, flushing flow downward through the gravel bed, which cleans the gravel and removes accumulated waste from the tank, without disturbing the gravel or any decorative plants of the like which may be present. The air lift pump desirably includes a bottom-slotted conduit extending transversely beneath the false bottom, an air inlet pipe at one end thereof, and an upstanding aerator pipe within the standpipe. This provides a two-stage pumping action, first, within the aerator pipe and, second, within the standpipe, which produces strong continuous circulation, and good aeration of the water.

3,814,255
TRIGLYCERIDE CHOLESTEROL ANALYSIS

Ronald B. Smernoff, Belmont, Calif., assignor to Analytical Products, Inc., San Carlos, Calif.

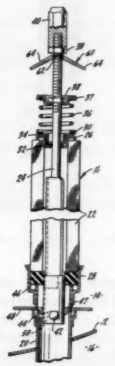
Filed July 11, 1972, Ser. No. 270,668
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 C **19 Claims**

The invention is concerned with a process for preparing a liquid sample for triglyceride and cholesterol analysis and the subsequent analysis of the sample thus prepared. The sample is prepared from a plasma- or a serum-lipid solvent composition. The preferred solvent is isopropyl alcohol. The cholesterol and triglyceride, along with most of the solvent, are separated from the composition by flowing the composition through a column comprising activated porous inorganic oxide particles. The activated particles are most preferably alumina, must have no more than a limited amount of fines, and principally fall within a 15 to 200 mesh size.

3,814,256
FILTER CARTRIDGES REMOVAL MEANS

Frank J. McGovern, Summit, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Aug. 24, 1973, Ser. No. 391,368
Int. Cl. B01j *29/24*
U.S. Cl. 210—323 **6 Claims**

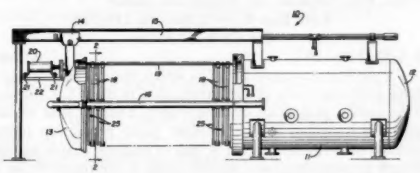


An improved apparatus for removing cylindrical filter cartridges from a tank. The upper ends of the filter cartridges receive spring actuated toggle type means. The toggle means are collapsible upon the exertion of a downward vertical force and spring back to their generally horizontal or extended position upon removal of the vertical force. A lift plate, having openings therethrough, is positioned above the cartridges with an opening in vertical alignment with each cartridge. The diameter of the openings is such as to permit the toggle means to pass therethrough when in their collapsed position and to prevent the toggle means from passing therethrough when in their extended position.

3,814,257
FILTER CAKE COMPRESSION SYSTEM

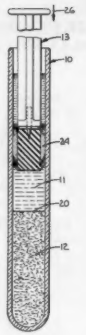
Henry Schmidt, Jr., Hinsdale, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Aug. 16, 1972, Ser. No. 281,053
Int. Cl. B01d *33/36*
U.S. Cl. 210—332 **8 Claims**



A filter cake compression system employs a dual surfaced flexible member resiliently supported about its periphery adjacent to a filter leaf, said member having an impervious back surface and an open pore, woven fabric facing the filter leaf.

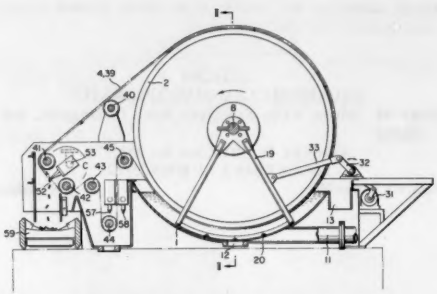
3,814,258
BLOOD PLASMA SEPARATOR WITH FILTER
Waldemar A. Ayres, Rutherford, N.J., assignor to Dickinson and Company, Rutherford, N.J.
Filed Mar. 15, 1973, Ser. No. 341,457
Int. Cl. B01d *33/00*
U.S. Cl. 210—359 **16 Claims**



A piston having spaced resilient annular seals and filter material disposed about the piston between the spaced seals is adapted to be inserted into an open end of a collection tube so that the resilient seals engage the interior surface of the tube and form a seal on each side of the filter material which also contacts both the piston and the interior of the tube. The collection tube is adapted to receive blood for separation into its light and heavy phases. A pusher is detachably connected to the piston for allowing the piston to be pushed in a downward direction through the light phase of the blood so that a pressure is created below the piston which causes the resilient seals to temporarily deform and leak, thereby allowing the light phase to flow in an upward direction around the piston and through the filter material into a space above said piston. When the piston reaches an interface between the light and heavy phases the downward movement is terminated and the push rod is withdrawn after being detached from the piston. The piston remains in place as a permanent barrier between the light and heavy phases of the blood contained in the collection tube. A stopper is provided to be inserted into the open end of the collection tube so that the separated phases of the fluid may be shipped or stored in the collection tube for future laboratory tests.

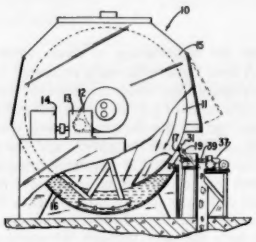
3,814,259
CYLINDRICAL VACUUM FILTER
Seigoro Kamimura; Masaji Imai; Takeo Azegami, and Youzi Fuzii, all of Nagaoka, Japan, assignors to Ohara Iron Works Co., Ltd., Nagaoka-shi, Niigata-ken, Japan
Filed June 5, 1972, Ser. No. 259,720
Int. Cl. B01d *35/16*
U.S. Cl. 210—391 **4 Claims**

A cylindrical vacuum filter, in which the circumferences of both axial end walls of the rotary suction drum are provided with axially projecting circular edges. Each of said circular edges is provided with a circular guide projection formed around the middle thereof. A pair of endless chains having a length greater than the circumference of the rotary drum are placed around said circular edges so that the connecting links on opposite sides of the chain hold said guide projection therebetween while the part of the chain which is clear of the rotary drum is engaged with sprockets fixed on both ends of the shaft of each roller of the group of guide rollers installed outside the rotary drum. An endless filter cloth covers the surface of the rotary drum and has the same length as said chains and is detachably fastened to the chains by its hems by means of hooks disposed inside the chains and is devised to run in a



zigzag path as guided by the group of guide rollers. Air nozzles disposed so as to be close to and to open toward the back of a portion of the filter cloth in the zigzag path.

3,814,260
KNIFE ADVANCE MECHANISM
Edward A. Daubman, and John W. Sherlock, both of East Moline, Ill., assignors to Ametek, Inc., New York, N.Y.
Filed June 9, 1972, Ser. No. 261,535
Int. Cl. B01d *33/06*
U.S. Cl. 210—396 **6 Claims**

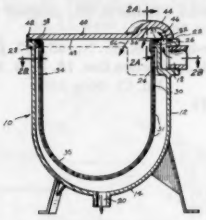


The filter cake accumulating on the cylindrical surface of a horizontal rotary drum filter is removed by a knife blade or scraper disposed adjacent the surface, the knife blade being mounted on a table which is movable toward and away from the drum on friction inhibiting supports. A variable speed driving mechanism is provided for slowly advancing the table toward the drum, and a fast speed driving mechanism is provided for rapidly positioning the table toward and away from the drum. The table is movably mounted by means of ball bushings on steel shafts fixed upon a supporting member. Cake slitting means and deflector plates are provided for guiding the scraped cake away from housings enclosing the ball bushings and away from the drum.

3,814,261
FILTER FOR LIQUID MATERIAL
Howard William Morgan, Jr., Michigan City, Ind., assignor to Filter Specialists, Inc., Michigan City, Ind.
Filed Jan. 22, 1973, Ser. No. 325,578
Int. Cl. B01d *29/14*
U.S. Cl. 210—453 **13 Claims**

A filter which includes a housing having a liquid inlet and a liquid outlet formed therein. A reticulated basket is fitted and supported within the housing in a spaced relationship from the housing side wall. A filter bag is fitted within the reticulated

basket and is supported by the basket in sealing engagement with a cap applied over the housing. The cap includes an upwardly offset marginal portion which in cooperation with the



inlet into the filter housing defines a passageway by which liquid can enter the housing and pass upwardly and over the upper marginal edge of the filter bag, down into the bag, through the bag, and out the liquid outlet.

3,814,262

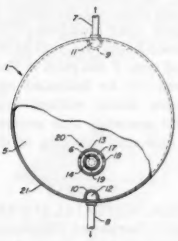
EMULSION SEPARATION APPARATUS

John Paul Nolley, Jr., Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 12, 1972, Ser. No. 297,171

Int. Cl. B01d *21/24*

U.S. Cl. 210—519 **9 Claims**



An emulsion separation apparatus which includes preferably a horizontally positioned vessel which contains concentric tubes which contain openings located preferably 180° apart to allow an emulsion to pass into the vessel through the inner tube of the series of tubes, through the opening in the inner tube into an annular volume between said tubes and out of the openings of an outer tube of the series of tubes. The volume within the settling vessel is a sufficient quantity to allow emulsion to there after be separated into two separate liquid phases relatively free of each other. This apparatus is applicable to the petrochemical arts and is especially useful for the separation of two phase emulsions into separate phases being relatively free of the other components of the emulsion.

3,814,263

TENNIS RACKET DISPLAY RACK

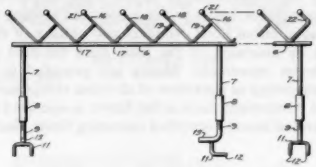
William C. Kinard, Pasadena, Calif., assignor to Relton Corporation, Arcadia, Calif.

Filed Mar. 17, 1972, Ser. No. 235,682

Int. Cl. A47f *7/00*

U.S. Cl. 211—13 **15 Claims**

The tennis racket display rack is supported horizontally from a perforated panel and has a plurality of skewed racket support bays for supporting adjacent racket heads parallel to each other and offset from each other for exposing a portion of the face of each racket. Each of the bays is formed by



cooperation of portions of adjacent L-shaped bars spot welded into a unitary structure. The rack permits the displayed rackets to face either right or left as desired.

3,814,264

DOUBLE SLEWING CRANE CONSTRUCTION

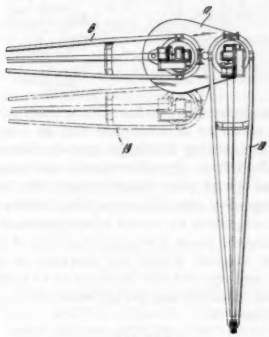
Egon Frick, Lubeck, Germany, assignor to Orenstein & Koppel AG, Lubeck, Germany

Filed June 8, 1973, Ser. No. 368,084

Claims priority, application Germany, June 6, 1972, 2227446

Int. Cl. B66c *23/84*

U.S. Cl. 212—3 **7 Claims**



A double slewing crane comprises a vertical column support which directly supports a first crane thereabove and which rotatably supports a jib bracket for rotation about the axis of the support and the vertical axis of the first crane. The jib bracket carries a second crane and it is revolved with the jib bracket around the first crane. The drive for revolving the jib bracket with the second crane about the first crane comprises two separate diametrically opposite driving motors having drive shafts with drive pinions which engage a gear ring disposed around the first crane and the support structure.

3,814,265

HYDRAULIC CRANE CONTROL SYSTEM HAVING MEANS FOR DEACTIVATING CONTROL VALVES WHEN OPERATING LIMIT IS EXCEEDED

Mickey J. Miller, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, Milwaukee, Wis.

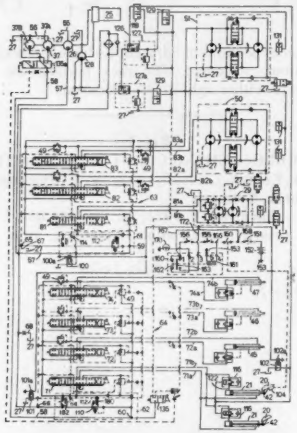
Filed Aug. 20, 1973, Ser. No. 389,882

Int. Cl. B66c *23/54*

U.S. Cl. 212—35 **7 Claims**

A mobile crane has a plurality of components which are selectively movable to various positions by means of individual hydraulic actuators (such as hydraulic motors or hydraulic rams) in response to selective operation of control valves. The control valves are grouped in one or more valve

banks and, preferably, each bank is supplied with fluid from its own engine-driven hydraulic pump. Diversion of fluid from within a certain section of each valve bank has the effect of rendering the control valves in the bank inoperative. The crane also includes a pilot pressure operated holding valve for the hydraulic boom hoist cylinders and closure of this valve (effected by diversion of the pilot fluid thereto) prevents further boom movement. Means are provided to prevent further movement or operation of all crane components in the event one component, such as the boom, is operated or about to be operated beyond specified operating limits. Such means

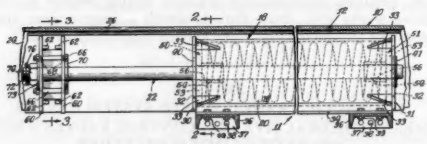


comprises a weight-load device for sensing that boom operating limits are about to be exceeded and an electric relay responsive to the sensing device to operate solenoid valves which divert fluid from the aforementioned section of the valve bank and divert pilot pressure from the boom hoist cylinder holding valve, thereby preventing further operation of any crane component by means of operation of a control valve and locking the boom in whatever position it is in. Selectively operable override means are provided to bypass the sensing device and operate the solenoids as to enable operation of the control valves and permit selective movement of the crane components.

3,814,266
RETURN SPRING UNIT FOR A RAILWAY CAR

Vaughn T. Hawthorne, Mechanicsburg, Pa., assignor to Keystone Industries Inc., Chicago, Ill.

Filed May 1, 1972, Ser. No. 248,890
Int. Cl. B61g *9/12, 11/02*
U.S. Cl. 213—8 **19 Claims**

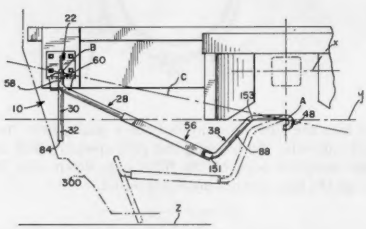


A return spring unit for a railway car, which can be installed as new construction or as a replacement, comprises a rod adapted to be secured to a coupler carrying element, a housing adapted to be secured to the car, and a spring guided in the housing and reacting between the rod and housing to return the coupler carrying element to a predetermined longitudinal position. The return spring unit is constructed so that at least the rod or housing is mounted to be movable laterally with respect to the longitudinal axis of the unit, and sufficient clearance is provided between its components to isolate the spring from lateral relative movements, thus reducing rubbing between the spring and housing and reducing spring stresses to provide increased spring life.

3,814,267
UNCOUPLING DEVICE FOR RAILROAD CARS

Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company, Lombard, Ill.

Continuation-in-part of Ser. No. 45,987, June 15, 1970, abandoned. This application Dec. 15, 1971, Ser. No. 208,125
Int. Cl. B61g *3/08*
U.S. Cl. 213—166 **14 Claims**

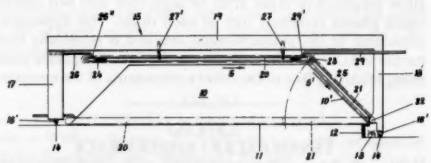


An uncoupling device for railroad cars especially suited for hydraulically cushioned cars including those of the long travel cushioning type having the couplers mounted for cushion travels in response to buff and draft forces of up to about thirty inches of travel, in which the uncoupling device comprises a lever assembly including a handle member secured to the car body for providing the necessary pivotal movement to operate the coupler lock lifter, a coupler lock lifter member operably engaged with the coupler lock lifter, and a floating rectilinear housing telescopingly receiving rectilinear portions of each of said handle and lock lifter members. The lever assembly is shaped to be disposed below the path of movement of the interlock structure of type F couplers in the event of a passed coupler impact and yet be balanced against rocking tendencies due to train action without requiring mechanical restraint. The lever assembly also accommodates the maximum buff, draft and side swinging of the coupler without going solid.

3,814,268
BULK MATERIAL SCRAPER

Gerhard Fischer, Dortmund-Kirchhorde, and Gunter Strocker, Holzwickede Kreis Unna, both of Germany, assignors to Gustav Schade Maschinenfabrik, Dortmund, Germany

Filed Nov. 1, 1972, Ser. No. 302,844
Claims priority, application Germany, Nov. 24, 1971, 2158172
Int. Cl. B65g *65/28*
U.S. Cl. 214—10 **15 Claims**

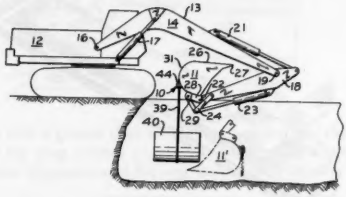


A bulk material scraper includes a gantry spanning a dump pile and having an articulated jib supported thereon for raising and lowering movement. The articulated jib is laterally supported by the gantry in all positions of the jib during raising and lowering movement thereof.

3,814,269
HOOK FOR EXCAVATOR BUCKETS

Ernest R. Blood, Washington; Robert W. Lichti, Oswego, and James A. Pierson, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 30, 1972, Ser. No. 257,825
Int. Cl. B66f 19/00
U.S. Cl. 214—145 3 Claims

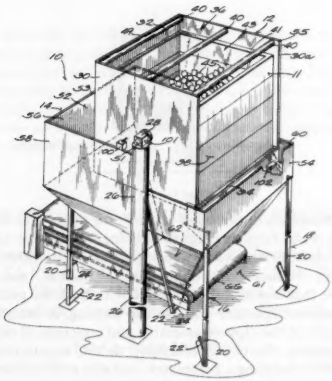


A hook for attaching a load supporting tension member to an excavator bucket which is adapted for pivotal movement between a plurality of predetermined digging positions and a plurality of substantially inverted load supporting attitudes. The hook is mounted on the bucket in noninterfering relation when the bucket is in the digging positions and maintains the tension member in load suspending relation from the bucket through a range of bucket positions in the inverted load supporting attitudes of approximately 180°.

3,814,270
DEVICE FOR EMPTYING CONTAINERS

Richard D. Murphy, Grand Rapids, Mich., assignor to Corduroy Rubber Company, Grand Rapids, Mich.

Filed Sept. 22, 1972, Ser. No. 291,306
Int. Cl. B65g 65/04
U.S. Cl. 214—302 3 Claims

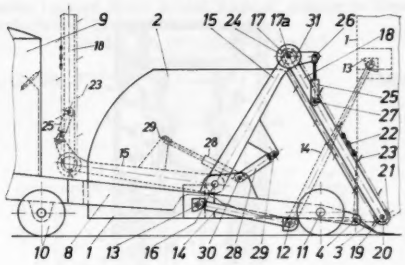


An unloading bin having an open top and front is rotatably supported about its center on a frame above an open topped hopper. The bin is rotatable about a horizontal axis centered with respect to the bin at selected rates from a "top-up" position to an inverted "bottom-up" position. An open-topped parts container is positionable in the bin through the open front and tilted rearwardly to empty the parts into the hopper by gradual rotation of the bin. Rods across the top of the bin prevent the container from falling out. In a preferred arrangement, the hopper is positioned above a conveyor which receives and removes the parts as they are fed through the hopper. A sensor associated with the conveyor controls the rate of tilt of the bin to control the rate of emptying.

3,814,271
LOADING, UNLOADING AND TRANSPORTING DEVICE

Willi Loock, Rotenhofer Weg 40, 237 Rendsburg, Germany

Filed June 26, 1972, Ser. No. 266,088
Claims priority, application Germany, June 29, 1971, 2132180
Int. Cl. B60p 1/04
U.S. Cl. 214—509 1 Claim

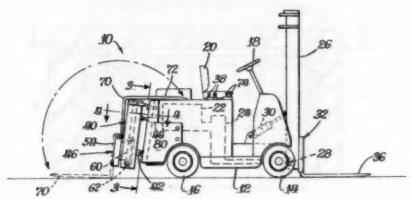


A loading, unloading, and transporting device consisting substantially of a carrier frame and driver housing mounted on wheels, a loading container pivotally mounted on an axis on the carrier frame, tilting cylinders provided between the carrier frame and the loading container, and pivotable carrier arms which carry a controllable reaming tool on their upper ends. A shovel plate is mounted on an axis wider than the outside edges of the wheels, and adjustable in its heightwise position. Carrier arms thus lift the reaming tool in its rearwardly pivoted position between the driver housing and the loading container so that small amounts of bulk goods can be loaded, unloaded, and transported.

3,814,272
BALANCED FORK LIFT TRUCK

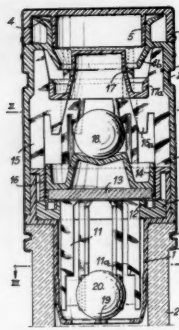
Richard J. Spratt, 8623 So. Ingleside, Chicago, Ill. 60619

Filed June 14, 1971, Ser. No. 152,540
Int. Cl. B66f 9/16
U.S. Cl. 214—660 1 Claim



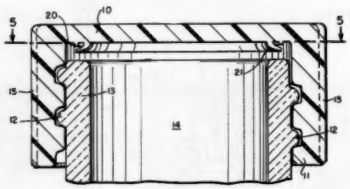
A balanced fork lift truck comprising a motorized steerable chassis having upright elevator masts tiltably mounted on opposite ends thereof, means for effecting inward tilting of the respective masts, and outwardly projecting load lifters supported on the respective masts for raising and lowering movements therealong, whereby loads can be picked up at both the forward and rearward ends of the vehicle and carried simultaneously to new locations where the loads can be individually redeposited by the truck.

3,814,273
POURING PLUG PREVENTING FRAUDULENT FILLING OF CONTAINERS
Andre Bereziat, Lyon, France, assignor to Astra Plastique, Saint Georges De Reneins (Rhone), France, a part interest
Filed Oct. 12, 1972, Ser. No. 296,937
Claims priority, application France, Oct. 14, 1971, 36917
Int. Cl. B65d *49/06*
U.S. Cl. 215—20 **4 Claims**



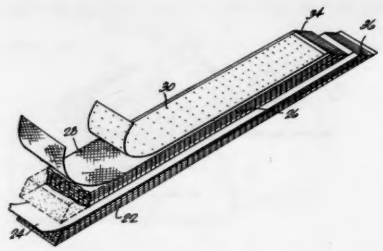
This invention relates to the capping of containers and its object is a pouring plug comprising an obturator subjected to magnetic attraction and to the action of two moving masses, this obturator being integral with a float which also forms an obturator by means of its lateral surface and which is calibrated in accordance with the considered liquid to prevent the fraudulent filling of the container.

3,814,274
LINERLESS CLOSURE FOR A CONTAINER
James A. McIntosh, Upper Montclair, N.J., assignor to Mack-Wayne Plastics Company, Wayne, N.J.
Filed Apr. 5, 1972, Ser. No. 241,155
Int. Cl. B65d *41/04*
U.S. Cl. 215—344 **3 Claims**



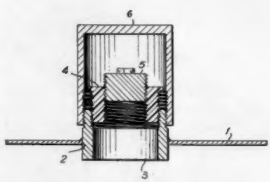
A linerless closure for a container has a top wall with a cylindrical skirt adapted to engage the neck of a container. An annular bead is provided inside the top wall of the closure and aligned with the wall of the neck of the container, and a "pre-bent" annular sleeve extends downwardly from the top wall of the closure, radially inwardly of the bead, the sleeve extending downwardly and outwardly in a first arcuate portion and thence downwardly and outwardly in a tapered portion that extends into axial alignment with the bead.

3,814,275
CRYOGENIC STORAGE VESSEL
Carl Robert Lemons, Westminster, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Apr. 3, 1972, Ser. No. 240,362
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 LG **10 Claims**



A ship for the transportation and storage of cryogenic temperature fluid wherein an inner insulation composite protects the container and ship hold from detrimental effect of such temperature. Resin impregnated fabric and perforated foil comprise a porous liner bonded to fiber-reinforced foam layers to form gaseous boundary layer insulation.

3,814,276
CORROSION-PROOF CLOSURE ASSEMBLY
Donald V. Van Gordon, Scotch Plains, and Peter J. McNally, Roselle, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.
Filed Aug. 14, 1972, Ser. No. 280,344
Int. Cl. B65d *41/04*
U.S. Cl. 220—39 R **4 Claims**

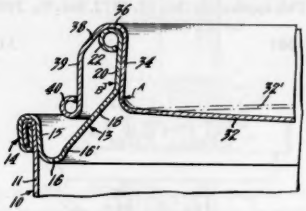


The tendency of threaded closures for metal containers employing metal caps or plugs to become inoperative as a result of corrosion or excessive wearing away of the threads is significantly reduced by employing a hollow, non-metallic member that is removably engaged with both the perimeter of the container aperture and the cap or plug. A metallic cover forms part of the closure assembly and conceals all non-metallic members, thereby conforming to the requirement for a container exhibiting a completely metallic exterior surface.

3,814,277
RECLOSABLE CAN
Leonard Thomas La Croce, Paramus, and Charles Stephan Radtke, Little Ferry, both of N.J., assignors to American Can Company, Greenwich, Conn.
Filed May 18, 1972, Ser. No. 254,408
Int. Cl. B65d *41/00*
U.S. Cl. 220—42 C **2 Claims**

A reclosable container having an annular ring with an inwardly-angled upwardly-extending substantially straight shoulder and a surmounting vertical throat whose interior surface frictionally sealingly engages the outer surface of a verti-

cal to inwardly-tapered friction wall on the container plug to provide a tight closure which minimizes leakage and plug dislodgment upon tipping. The diameter of the base of the

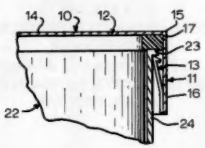


friction wall is greater than the throat diameter, and the junction of the plug central panel and friction wall is disposed lower than the junction of the ring shoulder and throat.

3,814,278
BARREL TOP FASTENER

Frederick P. Beierle, 4802 111th Ave. N.E., Kirkland, Wash. 98033

Filed May 8, 1972, Ser. No. 251,459
Int. Cl. B65d *43/10*
U.S. Cl. 220—60 R **4 Claims**

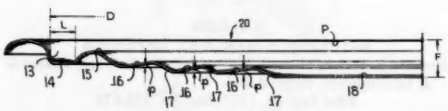


A non-reusable lid, for barrels having a peripheral rim, with plural spaced spring clips on the inside, outwardly movable to allow downward movement of the lid over the barrel but biased inwardly to catch against the barrel top rim. Sealing and upward pressure to maintain the clips in fastened position is caused by an annular sponge rubber gasket attached to the lid inner surface between it and the barrel top.

3,814,279
LID FOR METAL CAN AND THE LIKE, PARTICULARLY FOOD CAN

Jean Francois Rayzal, Paris, France, assignor to Etablissements J.J. Carnaud & Forges de Basseindre, Paris, France

Filed Apr. 14, 1972, Ser. No. 244,148
Claims priority, application France, May 18, 1971, 71.17897
Int. Cl. B65d *7/46, 43/14*
U.S. Cl. 220—66 **10 Claims**

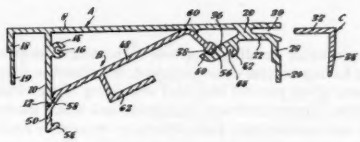


The disclosure relates to a lid for metal can or other packaging, the lid comprises in combination the following characteristics: slight sag at center; narrow cup bottom; high number of steps with each step ascending from the periphery of the lid toward its center; a bevel following each step and connected thereto by a relatively large radius.

3,814,280
METAL BOX STRUCTURE AND COMPONENTS THEREFOR

Maurice Leonard Ward, Bristol, England, assignor to Metalcraft (Bristol) Limited, Bristol, England

Filed Jan. 17, 1972, Ser. No. 218,413
Int. Cl. B65d *7/44*
U.S. Cl. 220—71 **7 Claims**

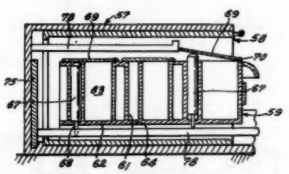


A box sign in which the bottom, top, and end walls are united into a rectangle. Each side of the rectangle is made from the same shaped extruded sections and each has an exposed first limb and a second limb at right angles to the first limb. Diagonal reinforcing members extend between the said limbs.

3,814,281
PROGRAMMED ARTICLE DISPENSING APPARATUS

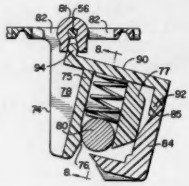
Joseph Denman Shaw, 508 Church St., Brownsville, Pa. 15417

Filed Aug. 20, 1973, Ser. No. 390,063
Int. Cl. B65g *1/00*
U.S. Cl. 221—5 **8 Claims**



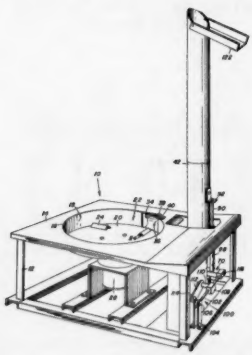
An apparatus including a cabinet containing a plurality of dispensing units and each unit having a number of article containing bins therein. Each bin is coded to dispense an article or articles therefrom when the cabinet is associated with an indexed decoding means. The coding means for each bin is a row of vertical cells that receive axially movable coding pins, said bin and its cells being normally closed by a releasable cover that is opened when the decoding means moves a coding pin against it which signals the operator that an article or articles in that opened bin are to be dispensed.

3,814,282
BALL WEDGE VENDING MACHINE MODULES
James P. Stoltz; James V. Bruckner, and Thomas O. Yingst, all of Conway, Ark., assignors to Polyvend, Inc., Conway, Ark.
Filed July 27, 1972, Ser. No. 273,978
Int. Cl. G07f *11/52*
U.S. Cl. 221—85 24 Claims



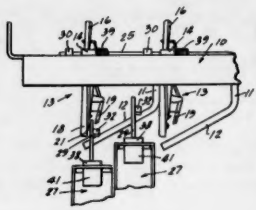
A replaceable vending machine merchandise dispensing module having endless-chain-mounted, merchandise supporting means which prevent improper dislodging of merchandise and ensure proper discharge therefrom, and which module is readily and mechanically insertable in or removable from the vending machine together with its merchandise supporting means without moving the drive motor, the electrical components or disconnecting the latter.

3,814,283
BALL COLLECTING AND FEEDING DEVICE
Bogusloew B. Cioth, Rolling Hills Estates, Calif., assignor to Vic Braden, San Diego, Calif.
Filed July 21, 1972, Ser. No. 273,704
Int. Cl. B65h *1/30*
U.S. Cl. 221—178 7 Claims



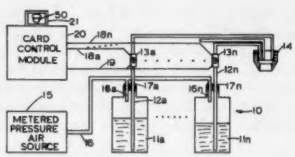
An apparatus for feeding a ball throwing machine of a type having an elevated ball inlet comprising a rotating plate disposed below ground surface for guiding balls collected therein one-by-one to a vertical upright and a piston reciprocally received in the upright for lifting a column of said balls to said ball inlet.

3,814,284
ACTUATOR FOR VENDING MACHINE
Charles H. Flubacker, 524 Karvard Ave., Arlington Heights, Ill. 60005
Division of Ser. No. 143,923, May 17, 1971, Pat. No. 3,727,869. This application Oct. 18, 1972, Ser. No. 298,667
Int. Cl. B65g *59/08*
U.S. Cl. 221—301 3 Claims



An improved merchandise supporting hook and release mechanism actuator for a vending machine for supporting merchandise in the vending machine and releasing it such that only a single article will be dispensed by the release mechanism during actuation.

3,814,285
FLUID MIXED DRINK CARD PROGRAMMABLE DISPENSER
Bryant F. Craig, 412 Northview Dr., Richardson, Tex. 75080
Filed Jan. 8, 1973, Ser. No. 322,120
Int. Cl. G07f *7/00*
U.S. Cl. 222—2 8 Claims

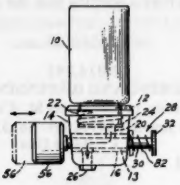


A mixed drink dispenser capable of very accurately dispensing and proportioning liquids in accordance with information punched on a card or on tape. A metered pressure air supply is connected to liquid supply bottles having individual valve controlled liquid line outputs to a dispensing head. The individual valves are controlled for predetermined time period fluid ingredient feed flow by time control turn-on, turn-off circuitry as selected by punched openings in a particular drink card inserted into the control module.

3,814,286
ADJUSTABLE MERCURY DISPENSER
Richard E. Welsh, Milford, Del., assignor to Dentsply Research & Development, Milford, Del.
Filed Feb. 28, 1973, Ser. No. 336,678
Int. Cl. B67d *5/22*; G01f *11/16*
U.S. Cl. 222—43 6 Claims

A dental amalgam dispenser having a reservoir and a cap connected thereto having a transverse passage provided with a plunger slidable longitudinally therein. The plunger has a mer-

cury-receiving space adapted to communicate respectively with inlet and discharge ports in said cap when moved longitudinally in said passage, and means operable relative to said plunger to vary the volume of said space to provide measured quantities of mercury of different desired amounts.



3,814,287

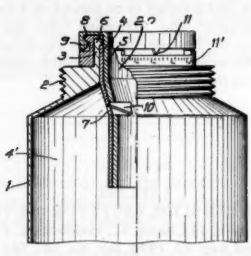
MULTICOMPARTMENT DISPENSER

Pierre Andre Darbon, Paris; Rene Louis Claude, Sevres, and Nelly Chesnot, Louveciennes, all of France, assignors to Societe Anonyme Dite: Clin-Midy, Paris, France

Continuation-in-part of Ser. No. 71,513, Sept. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 840,288, July 9, 1969, abandoned. This application Nov. 3, 1972, Ser. No. 303,380

Int. Cl. B65d *35/24*

U.S. Cl. 222—94 **12 Claims**



A multicompartment dispenser for dispensing paste-like substances including a container having an annular compartment supported therein and a controlled variable aperture communicating the compartment to the container in a manner permitting a controlled proportional mix of the two paste-like substances prior to discharge from the dispenser.

3,814,288

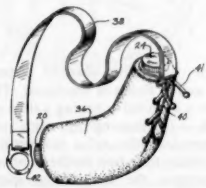
BEVERAGE CONTAINER

James L. Westrich, Algoma, Wis., assignor to Algoma Net Company, Milwaukee, Wis.

Filed May 24, 1973, Ser. No. 363,762

Int. Cl. B67d *5/56*

U.S. Cl. 222—129 **5 Claims**



Two bottles are enclosed within corresponding cavities in a pair of boot-shaped insulating half shells which are held together by a removable covering. The bottles are disposed at an obtuse angle to one another. At least one of the bottles is flexible and has a squirt cap closure on its open end. The insulating half shells are made of flexible insulating material so that squeezing the half shells together will transmit squeezing forces to the flexible bottle to force fluid out of the squirt cap closure. The other bottle has a relatively large open end and closure for receiving either a liquid or solid articles such as cigarettes, matches, or the like. A shoulder strap is provided for carrying the device.

3,814,289

MULTIPLE COMPONENT MIXING DEVICE

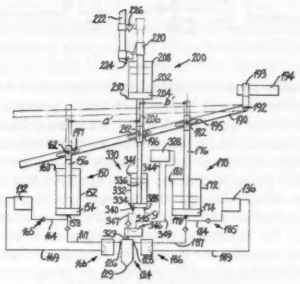
John E. Robbins, South Wigston, England, assignor to USM Corporation, Boston, Mass.

Filed Mar. 8, 1973, Ser. No. 339,428

Claims priority, application Great Britain, Mar. 21, 1972, 13067/72

Int. Cl. B67d *5/02*

U.S. Cl. 222—135 **7 Claims**



Apparatus for instantaneous ratioing and mixing of a multicomponent composition of at least three component ingredients wherein at least two of the ingredients are supplied in predetermined ratio and wherein total quantity of ingredients or the ratio of said two ingredients may be varied without influencing the relative amount of the third component.

3,814,290

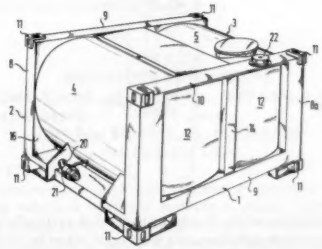
FREIGHT CONTAINERS FOR FLOWABLE GOODS

Helmut Gerhard, Weitefeld/Sieg, Germany, assignor to Westerwalder Eisenwerk Gerhard KG, Weitefeld/Sieg, Germany

Filed July 10, 1973, Ser. No. 378,021

Int. Cl. B65d *7/44*

U.S. Cl. 222—143 **10 Claims**



In a freight container for flowable goods the necessary ducts for interconnecting various compartments of the container so

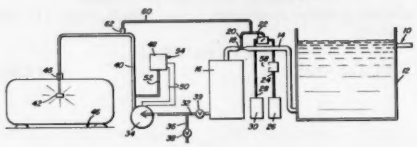
as to enable the cotents of these compartments to be discharged completely, are in the form of troughs defined by structural elements of the container walls. This construction simplifies manufacture and facilitates cleaning of the container.

3,814,291

AUTOMATIC BULK TANK CLEANSING SYSTEM

Clement J. Van Zutphen, Eau Claire, Wis., and Brian J. Moran, Minneapolis, Minn., assignors to Cotswold Dairy Equipment U.S.A. Ltd., Whitney, Oxon, England

Filed Sept. 20, 1972, Ser. No. 290,762
Int. Cl. B08b 9/08
U.S. Cl. 222—148 19 Claims



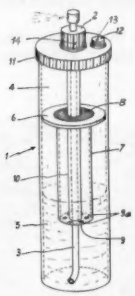
Apparatus to be used in cleaning the interior of a bulk milk tank comprises a water supply tank and a pump adapted to pump water in the supply tank through a spinner located in the tank to be cleaned. Means for mixing a concentrated iodophor sanitizer with the water in the supply tank is provided upstream of the pump so that the pump already filled with water first pumps water through the spinner and thereafter automatically pumps an aqueous chemical wash solution through the spinner. An automatic timing mechanism is provided for starting and stopping the pump, the timing mechanism being originally actuated manually with shut off being accomplished when all the water in the supply tank has passed through the pump.

3,814,292

SPRAY DISPENSER FITTED WITH A DEMINERALIZING CARTRIDGE

Bernard Dargols, 75 Rue des Monts Clairs, 92 (Hauts de Seine) Colombes, France

Filed May 19, 1972, Ser. No. 254,945
Claims priority, application France, June 7, 1971, 71.20448
Int. Cl. B67d 5/58
U.S. Cl. 222—189 3 Claims



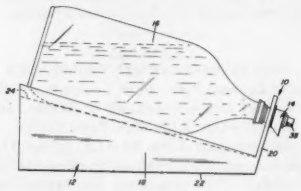
The container of the dispenser is divided vertically into two chambers which communicate with each other by means of a semi-immersed interchangeable cartridge containing a charge of ion-exchange resins and having openings at both ends. The top chamber is filled by hand with water to be demineralized which passes down through the cartridge and collects in the bottom chamber. The eduction tube of the dispenser extends in leak-tight manner through the partition-wall between the two chambers and through the cartridge or only through the partition-wall and has its opening near the end-wall of the bottom chamber.

3,814,293

BOTTLE SECURING AND DISPENSING APPARATUS

Jimmy Edward Daves, 165 W. Peace St., Canton, Miss. 39046

Filed Jan. 31, 1973, Ser. No. 328,169
Int. Cl. B67d 5/64
U.S. Cl. 222—173 4 Claims



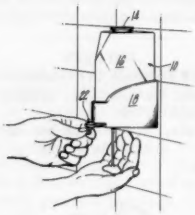
A dispensing rack and valve assembly for use with quart or king-size bottles of beverages. The rack supports a bottle in an inclined position and is suited to be placed on a shelf in a conventional refrigerator. The dispensing valve has a threaded portion to engage the threaded mouth of a conventional bottle of carbonated beverage. The valve assembly cooperates with the rack to secure the bottle in place.

3,814,294

DISPENSER AND SLIDE VALVE FOR USE THEREIN

Robert S. Stevenson, 44 Champ St., Middletown, Conn. 06457

Filed Aug. 13, 1973, Ser. No. 387,743
Int. Cl. B67d 3/00
U.S. Cl. 222—181 10 Claims



Apparatus for the gravity assisted dispensing of selected quantities of viscous fluids is disclosed. The dispensing apparatus includes a slide valve having a slide member shaped to cooperate with a dispensing aperture to terminate flow without any excess as the valve is operated in the closing direction. The slide member further carries an O-ring seal which circumscribes the dispensing aperture to prevent leakage with the valve in the fully closed position. Spring pin means is provided to limit the movement of the slide member in at least a first direction and to retain the slide member in a cooperative relationship with the remainder of the dispenser.

3,814,295

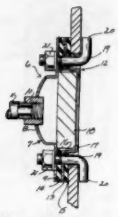
DEVICE FOR FLUIDIZING STORED MATERIAL

Douglas C. Steltz, Brookfield, Wis., assignor to Portec, Inc., Waukesha, Wis.

Division of Ser. No. 858,937, Sept. 18, 1969, Pat. No. 3,656,812. This application Mar. 24, 1972, Ser. No. 237,913

Int. Cl. B65g 53/40

U.S. Cl. 222—195 5 Claims



A device for injecting a gas into bulk material stored within a vessel to enhance the flow characteristics of the material. The device includes a housing to be mounted within an opening in the wall of the vessel and having a connection to a source of gas under pressure. The housing supports a porous metal filter element which permits the flow of gas into the material confined within the vessel but prevents the escape of the material into the pressurized gas system. The housing is designed so that it can be attached to the vessel wall entirely from the exterior of the vessel.

3,814,296

METERING APPARATUS FOR PLASTIC MATERIALS

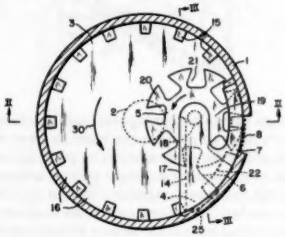
Alfons Tschritter, Mittelbuchen near Hanau, Germany, assignor to Colortronic Reinhard & Co. KG, Bad Homburg, Germany

Filed Jan. 30, 1973, Ser. No. 328,097

Claims priority, application Germany, Mar. 28, 1972, 2214982

Int. Cl. G01f 11/24

U.S. Cl. 222—220 6 Claims



A metering device for plastic materials comprising a bin having a rotating feed disc at the bottom thereof. The feed disc has peripheral cogs which partially define a metering chamber. Facing the metering disc is an ejection disc having teeth meshing with the cogs for forcing material into the metering chamber and ejecting the material from the metering chamber through an opening in the side of the bin.

3,814,297

INHALATION ACTUATED AEROSOL DEVICE FOR DISPENSING A METERED QUANTITY OF FLUID

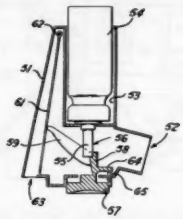
William Edward Warren, Cuffley, England, assignor to Bespak Industries Limited, Cheshunt, Waltham Cross, England

Filed Nov. 15, 1972, Ser. No. 306,950

Claims priority, application Great Britain, Nov. 25, 1971, 54852/71

Int. Cl. B65d 83/14

U.S. Cl. 222—402.13 6 Claims



A device for dispensing fluid from an aerosol container of the kind having a spray stem or spray head which, when actuated, dispenses fluid from the container, the device comprising a duct having an inlet and an outlet, means to receive the aerosol container with the outlet of the spray stem or head communicating with the duct, a strut engageable with the stem or head so that relative movement of the strut towards the container will press the stem or head inwardly of the aerosol container, and means for disengaging the strut to release the stem or head when the air pressure at the outlet of the duct falls below the air pressure at the inlet of the duct.

3,814,298

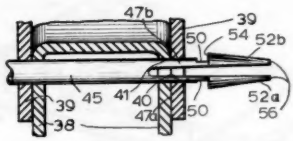
SAFETY RELEASE PIN

Arne Hansen, New City, N.Y., assignor to Walter Kidde & Company, Inc., Belleville, N.J.

Filed Feb. 5, 1973, Ser. No. 329,614

Int. Cl. B65d 27/30, 55/06

U.S. Cl. 222—153 8 Claims



A safety pin of an inexpensive construction having a breakaway portion which gives an indication that an apparatus has been previously operated.

3,814,299

ROD STOCK FEED MEANS

Robert Jack Spercel, c/o Sperco Inc. 7810 Lake Ave., Cleveland, Ohio 44102

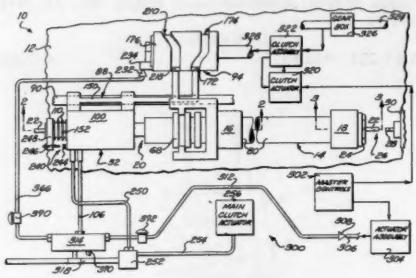
Filed June 14, 1972, Ser. No. 262,544

Int. Cl. B23q 5/22

U.S. Cl. 226—162 6 Claims

An improved bar stock feed mechanism includes a gripper assembly which is operable between a closed condition in which gripping surfaces clampingly engage the bar stock and an open condition in which the gripping surfaces are spaced from the bar stock. Prior to the initiation of a bar feed operation, the gripper assembly is closed to securely grip the bar stock. A spindle chuck is then opened and the gripper as-

sembly is moved toward the chuck through a feed stroke. Upon completion of the feed stroke, the chuck is closed. The gripper assembly is then opened and moved away from the



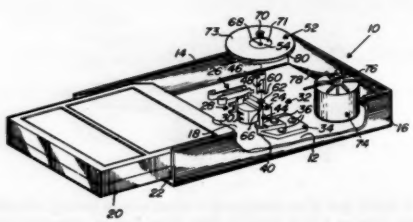
chuck through a return stroke. If the gripper assembly is closed without a piece of bar stock in the gripper assembly, a detector is actuated to provide a control signal which effects an interruption in bar feed operations.

3,814,300

CAPSTAN DRIVE ASSEMBLY FOR A CARTRIDGE TAPE PLAYER

Gary P. Fukayama, Roselle, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed June 21, 1973, Ser. No. 372,383
Int. Cl. B65h *17/20*
U.S. Cl. 226—194 **8 Claims**



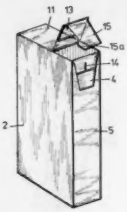
A capstan drive assembly for a cartridge type tape player includes a hollow capstan shaft member attached at one end to a flywheel for rotation therewith. The capstan shaft member receives, through the opposite end thereof, a support shaft extending upwardly from a base member fixedly mounted on the base wall of the cartridge tape player deck. A bearing surface member within the hollow capstan shaft engages the support shaft to minimize friction. The hollow shaft and flywheel are driven rotatably on the support shaft by a drive motor coupled to the flywheel by a drive belt or the like. In one embodiment, the free end of the hollow capstan shaft engages a thrust washer or bearing surface on the base member for rotation thereon. In another embodiment, a bearing ball is placed in a recess at the free end of the support shaft and the capstan and flywheel are supported thereon.

3,814,301

BOX FOR CIGARETTES AND CIGARILLOS MADE FROM A BLANK

Otto Niepmann, Gevelsberg, Germany, assignor to Maschinenfabrik Fr. Niepmann & Co., Gevelsberg, Germany

Filed Sept. 6, 1972, Ser. No. 286,721
Claims priority, application Germany, Feb. 17, 1972, 2207449
Int. Cl. B65d *5/72*
U.S. Cl. 229—17 R **3 Claims**



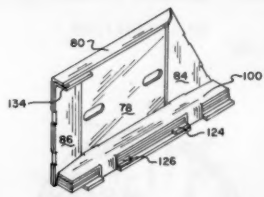
A box for cigarettes or the like, formed by folding a thin blank of paper-like material together. One end of the top wall of the box has a flap extending down over the adjacent side wall and the side wall beneath the flap is secured thereto and is cut so that upon lifting the flap the portion of the side wall connected thereto will tear out. The top wall is perforated along the side edges at the flap end to tear loose and form an opening when the flap is lifted. The side wall, beneath the flap, has a T slot into which the free end of the flap can be inserted to reclose the package.

3,814,302

BATHTUB CONTAINER

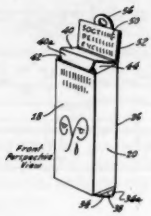
Everett A. Coons, West Monroe, La.; Lewis D. Poggiali, and Richard P. Jacalone, both of Owosso, Mich., assignors to Olikraft, Inc., West Monroe, La.

Division of Ser. No. 223,582, Feb. 4, 1972. This application Jan. 10, 1973, Ser. No. 325,048
Int. Cl. B65d *5/32, 5/50*
U.S. Cl. 229—23 R **7 Claims**



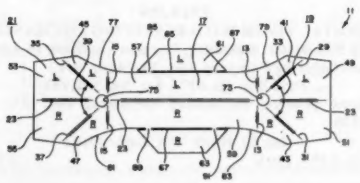
An improved bathtub shipping package for completely encircling the bathtub to protect the bathtub from rough handling and the elements of weather. The package comprises a wrap-around tube member having a pair of unique end caps fixedly attached to the tube member, the end caps having built in means for reinforcing the end caps from horizontal and vertical shock as well as built in protective pads for protecting the top end portions of the bathtub whenever the bathtub is placed within the package. The structural manufactured joint for the tube member is formed at the bottom rear of the tube which serves to cushion the rear legs of the bathtub whenever the bathtub is placed within the package. The end caps are positioned within the tube in combination with the structural manufactured joint so that longitudinal stapling of the end caps to the tube member is easily accomplished due to the resistance of the structural manufactured joint.

3,814,303
BOX BLANK
William Paul Smith, Compton, Calif., assignor to Graphic Arts Packaging Corp., Gardena, Calif.
Filed June 12, 1972, Ser. No. 261,791
Int. Cl. B65d 5/08
U.S. Cl. 229—38 3 Claims



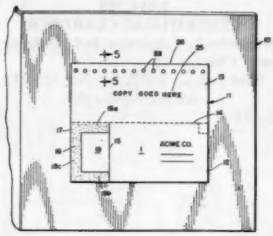
An improved one-piece blank, composed of paperboard or other suitable material, is provided for the construction of a box having rectangular front, rear and side panels, and further having end and cover flaps, and a pair of additional flaps adapted to be folded over one another to provide an extended end for the rear wall of the box. This extended end forms an advertising panel, and it has a hang tag formed in its rear side whereby the box may be hanged from a rack, without obstructing the message on the extended end.

3,814,304
HANDLE FOR CARTON
William A. Hester, Memphis, Tenn., assignor to Eastex Packaging Inc., Oak Brook, Ill.
Division of Ser. No. 47,014, June 17, 1970, Pat. No. 3,627,194.
This application July 15, 1971, Ser. No. 163,049
Int. Cl. B65d 5/46
U.S. Cl. 229—52 AL 2 Claims



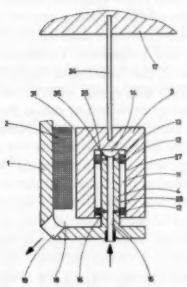
A preformed foldable blank made of pliable sheet material, e.g., polyethylene coated boxboard, made use of in forming a bail-like handle that is attached to a gabled top carton for packaging various products. The blank includes a plurality of panels formed by various predetermined foldlines. Folding the blank in a predetermined sequence along the foldlines provides a retracted handle which is fixedly attached to the crown of the carton by staples. The handle remains retracted while the carton is processed through the normally automatic casing and filling sequence, while stored and while being transported before use. The user, e.g., retail customer, expands or opens the handle at the time of purchase for the purpose of conveniently carrying the carton. Breakaway tabs provide reinforcement of the attachment means of the handle to the carton and hold the handle in its retracted form prior to use. The breakaway tabs are separated from the remaining structure by the user prior to expanding the handle.

3,814,305
POSTCARD COIN CARRIER, AND METHOD
Mathias E. Szeyller, 251 Brookmead Rd., Wayne, Pa. 19087
Filed Apr. 14, 1972, Ser. No. 244,140
Int. Cl. B65d 85/54
U.S. Cl. 229—92.9 1 Claim



A postcard coin carrier and method wherein a unitary paperboard card of generally rectangular configuration having a transverse line of potential folding to provide an end flap, the end flap being equipped with a U-shaped pattern of remoistenable adhesive so as to provide a pocket for enclosing a coin or bill, the card being equipped with an integral extension separated by a line of perforation -- the extension carrying advertising matter and providing an edge portion for securement to a larger sheet, such as a publication; the edge portion of the extension also being equipped with pin-receiving openings for high speed application of the extension-equipped card to the publication.

3,814,306
CENTRIFUGE WITH LUBRICATION SYSTEM THEREFOR
Max Wutz, Hanau/Main, and Hartmut Sinn, Osterode/Harz, both of Germany, assignors to Heraeus-Christ GmbH, Gipsmuhlenweg Osterode/Harz, Germany
Filed May 1, 1972, Ser. No. 249,173
Claims priority, application Germany, May 6, 1971, 2122464; July 30, 1971, 2138141
Int. Cl. B04b 9/02
U.S. Cl. 233—24 22 Claims



To provide a well lubricated thrust and running bearing, the housing of a centrifuge is formed with a projecting bearing pin over which a cup-shaped element extends which is rotatable over the pin, the cup-shaped element and the pin having cooperative bearing means at the interior wall of the cup-shaped element, and the elements are formed to provide for introduction of lubricant in the space between the interior wall of the cup-shaped element and the opposite projecting, facing surface of the pin, to provide for lubrication without splashing; in a preferred form, the cup-shaped element itself is

the rotor of an electric drive motor, and formed internally with a hemispherical projection which fits into a similar hemispherical depression in the pin, the pin being formed with a duct for oil to be supplied under pressure, the oil being introduced in the space between the bottom surface of the cup-shaped rotor element and the top surface of the pin.

3,814,307

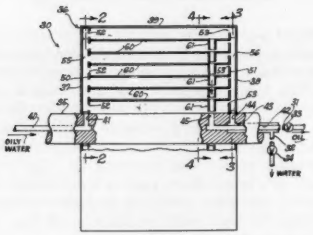
CENTRIFUGAL CLARIFIER

Robert J. Hengstebeck, Valparaise, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Jan. 12, 1973, Ser. No. 323,212

Int. Cl. B04b *1/00*

U.S. Cl. 233—31 **26 Claims**



A centrifugal clarifier for removal of contaminants from a liquid by centrifugally separating it into two liquid phases includes a rotor comprising a rotor shaft, a rotor housing mounted on the shaft to enclose an elongated intermediate portion of the shaft so as to provide around the shaft an elongated annular working space, and a set of cylindrical shells mounted in the housing and concentric with the shaft to provide elongated annular chambers of equal radial height within the working space for a set of flows of liquid parallel to the shaft but at different average radial distances from the shaft. Distributor means of the rotor extends radially from the shaft within one end portion of the housing and has openings at different radial distances from the axis of the shaft to furnish liquid separately to the chambers. Collector means of the rotor to receive one of the separated liquid phases extends radially from the shaft within the other end portion of the housing and has openings at different radial distances from the axis of the shaft to communicate with chambers. The total area of openings of the distributor means (or of the collector means when appropriate) communicating with a specific chamber is proportional to the square of the average radius of the chamber to provide a linear flow of liquid through each chamber proportional to the square of that average radius of the chamber. Collector means of the rotor for the other separated liquid phase is located between these end portions of the housing. A feed passageway in the shaft communicates with the distributor means. Outlet passageways in the shaft communicate with the two collection means. The clarifier has outlet pipes communicating with the outlet passageways. The outlet pipe that thereby communicates with one of the collector means to receive that liquid phase containing removed contaminant is valved to control the volume ratio of that liquid to the clarified liquid removed through the other outlet pipe. There may be a valve in that other outlet pipe to adjust overall flow rate through the parallel chambers in the working space when necessitated by a change of concentration of contaminants in the feed liquid.

3,814,308

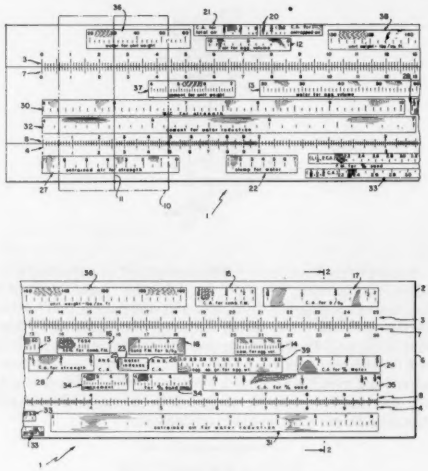
CALCULATING DEVICE

Andrew Kolan, Severna Park, Md., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Dec. 6, 1972, Ser. No. 312,643

Int. Cl. G06g *1/02*

U.S. Cl. 235—70 **20 Claims**



A calculator for estimating concrete mix proportions of air, cement, water, fine and coarse aggregates comprising a calculating device having a pair of linear scales, a pair of logarithmic scales and a slidable cursor. Each pair of the scales has associated therewith a group of scalar representations of concrete mix factors which are interrelated. All members of each group are set forth in a visually distinct manner so as to facilitate computations by use of the calculator.

3,814,309

DIGITAL TIMER WITH RESETTING MECHANISM

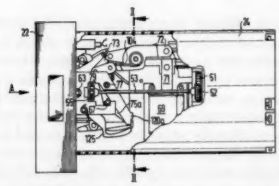
Rudolf Ramstetter, Starnberg, Germany, assignor to American Manufacturing Company, Inc., Brooklyn, N.Y.

Filed Dec. 20, 1972, Ser. No. 316,982

Claims priority, application Germany, Dec. 23, 1971, 2164330

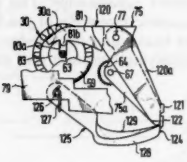
Int. Cl. H01h *7/08*; **G06c** *15/42*

U.S. Cl. 235—130 R **6 Claims**



In a settable and resettable digital wheel timer or the like wherein resetting means rotate all the wheels back to their original starting position, a latching assembly is provided to lock the reset means in its wheel-engaging position until the clutch and carry gears associated with the wheels are brought into mesh with those wheels at the beginning of an operating

cycle. The latching assembly is actuated by a first lever moving in unison with the gears which presses on a second lever that first keeps the resetting means engaging the wheels and then releases the resetting means from the wheels only when



the clutch gear and the other gear actually engage the wheels. This latching action prevents undesired accidental rotary self-movement of the wheels when the clutch is disengaged but is moving into engagement.

3,814,310

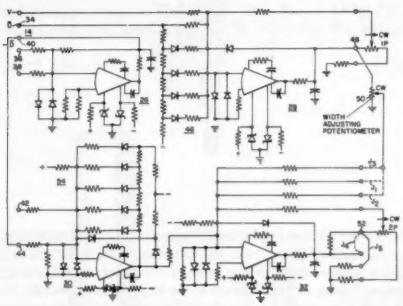
STATIC INERTIA COMPENSATION FUNCTION GENERATOR

Mohammed Safiuddin, North Tonawanda, N.Y., and Gary L. Morrison, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 29, 1972, Ser. No. 310,515

Int. Cl. G06g *7/26*; **B65h** *59/38*

U.S. Cl. 235—197 **4 Claims**



This disclosure relates to a static inertia compensation function generator for use in a constant tension control system for a d.c. drive motor operating to wind or unwind a reel of material. A first generator develops a signal $\overline{D}$ which is a function of the normalized instantaneous diameter of the reel. A second generator receives the signal $\overline{D}$ and generates a signal $-\alpha_1 K_1 \overline{D}^2$ which is a function of the square of the normalized instantaneous diameter, α_1 and K_1 being constants. An inverter also receives the $\overline{D}$ signal and delivers an inverted normalized instantaneous diameter signal $-\overline{D}$. A third generator receives the inverted signal $-\overline{D}$ and develops a signal, $1/\overline{D}^2$ which is a function of the normalized instantaneous diameter squared. A summation amplifier receives the two signals: $-\alpha_1 K_1 \overline{D}^2$ and $1/\overline{D}^2$ and delivers an amplified inertia compensation signal $Iac = \alpha_2(\alpha_1 K_1 \overline{D}_2 + [1/\overline{D}^2]$ where α_2 is the gain of the amplifier. The inertia compensation signal *Iac* is additive or subtractive from a current reference I and is used for accelerating or decelerating the d.c. motor for the purpose of maintaining constant tension on the material under dynamically varying load conditions.

3,814,311

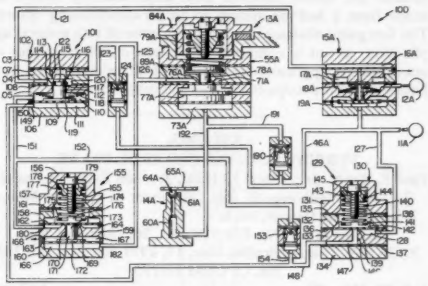
FLUID CONTROL SYSTEM AND METHOD OF OPERATING THE SAME

Louis M. Puster, Knoxville; Jay L. Lewis, and Harold G. Brakebill, both of Concord, all of Tenn., assignors to Robertshaw Control Company, Richmond, Va.

Filed Nov. 20, 1972, Ser. No. 308,111

Int. Cl. F25b *29/00*; **G05d** *23/275*

U.S. Cl. 236—47 **10 Claims**



A fluid control system having a fluid supply means and a fluid operated device. A branch chamber of a fluid operated relay is interconnected by a movable valve means with the exhaust chamber thereof or with the main chamber thereof in response to fluid conditions existing in the pilot chamber thereof. The fluid supply means is interconnected to the main chamber of the relay and to a fluid biasing chamber of a fluid operated pressure regulator. The fluid operated device is interconnected to the branch chamber of the relay and the pressure regulator is interconnected to the pilot chamber of the relay. A condition responsive fluid bleed device is interconnected to the biasing chamber whereby the condition responsive fluid bleed device effectively bleeds the biasing chamber of the fluid being supplied thereto from the fluid supply means in response to conditions being sensed thereby so that the pressure regulator maintains the fluid pressure in the pilot chamber in relation to the condition being sensed whereby the fluid being supplied the fluid operated device from the branch chamber is varied in relation to the conditions being sensed by the condition responsive fluid bleed device.

3,814,312

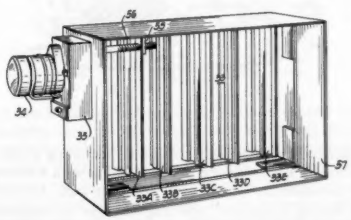
TEMPERATURE CONTROL DEVICE

Merton F. Gerhauser, Cleveland, Ohio, and Emil O. Young, deceased, late of Beachwood, Ohio (by Gladys R. Young, executrix), assignors to Young Regulator Company, Warrensville, Ohio

Filed Aug. 4, 1972, Ser. No. 277,890

Int. Cl. F24f *11/04*

U.S. Cl. 236—49 **9 Claims**



A temperature control device for a zone heating and cooling system is disclosed wherein each zone can be individually

temperature controlled by a modulation action of the temperature control device. Each zone has a temperature sensor and a movable member to vary the aperture of the air duct to the zone. Each temperature sensor has a first and a second contact with a bimetal therebetween. The sensor means controls hot air with the movable member through a reversible motor to open the aperture when the temperature of the room is below a first reference temperature and to close the aperture when the temperature is above a second reference temperature. The device includes a control element means to reverse the motor function and simultaneously switch all zones from a heating system to an air-conditioning system. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,814,313

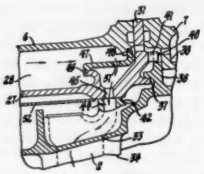
TURBINE COOLING CONTROL VALVE

Paul E. Beam, Jr.; Albert L. Hunt, Jr., and Esten W. Spears, Jr., all of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 770,919, Oct. 28, 1968, Pat. No. 3,736,069. This application Mar. 17, 1971, Ser. No. 125,245

Int. Cl. G05d *23/275*

U.S. Cl. 236—93 **3 Claims**



The stator of a gas turbine includes an arrangement for controlling flow of cooling air to the vanes of the second stage turbine nozzle from the engine compressor. Control is by a valve defined by two rings extending around the exterior of the turbine nozzle which have different coefficients of thermal expansion so that the gap between them varies in accordance primarily with the temperature of the cooling air which tends to increase with the power output of the engine and thus with the need for cooling air.

3,814,314

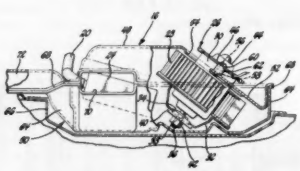
VEHICLE REAR COMPARTMENT HEATER

Russell L. Morden, 1528 Drexel Rd., Lansing, Mich. 48915

Filed Oct. 20, 1972, Ser. No. 299,381

Int. Cl. B60h *1/06*

U.S. Cl. 237—12.3 B **2 Claims**



An auxiliary vehicle heater assembly including a split housing enclosing a heater core in combination with a blower and motor subassembly providing a compact unit. An electrical motor driving a squirrel type cage blower is concentrically mounted therein resulting in a compact subassembled unit. The split housing has an angularly extending face containing an air inlet opening. The blower and motor subassembly is secured to the housing in an angular disposition with the motor shaft substantially perpendicular to the surface of the angular cover face. The heater core, receiving hot water directly from the vehicle engine cooling system or being connected in series with the usual compartment heater, is also angularly disposed within the housing. A portion of the core, due to the angular mounting, has a portion extending underneath the motor and blower subassembly. This positioning of the core and the concentric mounting of the blower and motor provide a compact heater unit suitable for mounting under a vehicle seat for supplying heat to a rear passenger compartment.

3,814,315

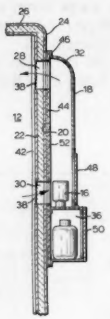
NOSE-MOUNTED CATALYTIC CARGO TRAILER AND TRUCK BODY HEATERS

Anthony Dmysh, 2568 Royal Windsor Dr., R.R. No. 5, Clarkson, Ontario, Canada

Filed June 15, 1972, Ser. No. 263,143

Int. Cl. B60h *1/22*

U.S. Cl. 237—31 **2 Claims**



A warm air recirculating housing for accommodating a catalytic heater in the base thereof is secured in air-excluding contact against the exterior side of the front wall of a cargo-carrying trailer or truck body so as to project forwardly from said side. The housing communicates with the trailer interior by way of a warm air discharge opening near the top of the front wall and housing, and by way of an air-return opening near the bottom of said front wall so that the trailer interior is fully utilized for cargo.

3,814,316

DRYER FEED NOZZLE ASSEMBLY

Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing & Equipment Company, Hatfield, Pa.

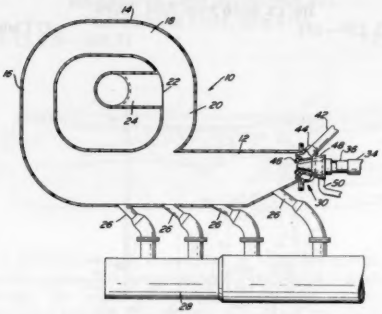
Filed June 18, 1973, Ser. No. 370,985

Int. Cl. F26b *3/08*; B05b *1/34*

U.S. Cl. 239—8 **8 Claims**

A feed assembly for fluid energy type mills wherein dispersions of granular material or solutions are fed through a nozzle and are entrained in tangentially directed jets of gaseous fluid which create a vortex in front of the jet nozzle and atomize or aspirate the wet particles. A vacuum which is formed between

the tip of the feed nozzle and the vortex is broken and which thereby creates a suction to pull particles back against the



nozzle tip, causing abrasion, is broken by the insertion of low pressure gaseous fluid between the vortex and the nozzle tip.

3,814,317

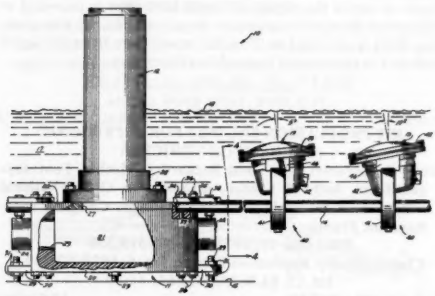
ILLUMINATED WATER FOUNTAINS

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corp., Burbank, Calif.

Continuation-in-part of Ser. No. 87,886, Nov. 9, 1970, Pat. No. 3,705,686. This application Nov. 6, 1972, Ser. No. 304,244

Int. Cl. F21p *7/00*

U.S. Cl. 239—18 **5 Claims**



A support base for an ornamental water fountain includes a base housing having at least one water inlet opening to an internal chamber from an upper portion of which an outlet opening is formed through the housing. A fountain nozzle is coupled to the housing via the outlet opening. A plurality of lamp support arms are each connected at one end thereof to the housing to extend radially from the housing substantially normal to the axis of the chamber outlet opening. At least one lamp is mounted to each arm to illuminate the fountain pattern produced by water discharged from the nozzle. The base and lamps may be installed as a unit in a fountain bowl. By connection of floats to the support arms or to the housing, the assembly may be used as illuminated floating fountain in lakes and the like.

3,814,318

MEANS PROVIDING RANDOM MOVEMENT ESPECIALLY FOR USE IN LUMINOUS FOUNTAINS

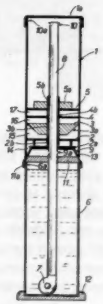
Maximilian G. A. C. Michaelis, 13 Quai St. Michel, Paris V, France

Filed Feb. 2, 1973, Ser. No. 329,009

Claims priority, application France, Feb. 10, 1972, 72.04485

Int. Cl. B05b *17/08*; **G09f** *13/24*

U.S. Cl. 239—23 **10 Claims**



A plurality of discrete discs of different specific gravity are guided for vertical movement in a transparent container. Random movement of the discs is initiated by introducing a liquid into the container at locations above and below the discs.

3,814,319

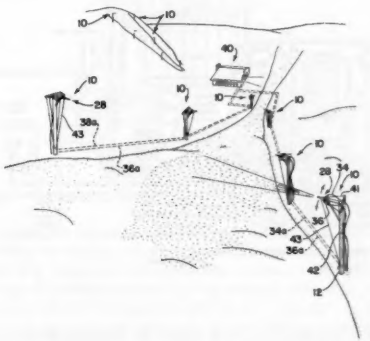
METHOD AND APPARATUS FOR MAKING SNOW

Harry J. Loomis, Glenwood, N.Y., assignor to Alfred C. Body, Shaker Heights, Ohio, a part interest

Filed Jan. 7, 1969, Ser. No. 789,569

Int. Cl. F25c *3/04*

U.S. Cl. 239—2 S **10 Claims**



The disclosure is directed to the method of, and apparatus for, making snow by discharging atomized water particles at high velocity with compressed air into an ambient atmosphere of less than 32*LF*. The method provides the improved step of discharging the particles at an elevation of ten feet or more above the level of the surface to be covered with snow. Preferably, the discharge is accomplished at an elevation above 20 feet above the surface to be covered. The apparatus disclosed is specifically adapted to carry out the noted method.

3,814,320
DE-ICING SPRAYING APPARATUS

Stephen J. Skurray, Basingtoke, England, assignor to Evers and Wall Limited, Newbury, Berkshire, England

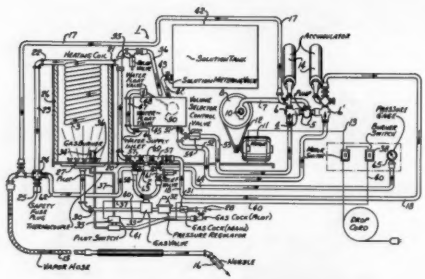
Filed Oct. 26, 1972, Ser. No. 301,084
Claims priority, application Canada, June 30, 1972, 146151
Int. Cl. B05b 1/20
U.S. Cl. 239—127 10 Claims

De-icing spraying apparatus constructed so as to provide one or two wing boom assemblies, each for projecting on a respective side of a spraying vehicle and having spaced-apart spray nozzles supported thereon to permit spraying of an airport runway. A centre spraying section is also provided and the wing boom sections are foldable along the sides of the vehicle when not in use to permit travel of the vehicle along a highway. Resilient support cables are provided between the centre section and each wing boom section.

3,814,321
LIQUID HEATING FEEDBACK SYSTEM

Terence H. Mulholland, Pittsburgh, and Fred B. Kruger, Monaca, both of Pa., assignors to Homestead Industries, Inc., Coraopolis, Pa.

Filed Jan. 10, 1973, Ser. No. 322,521
Int. Cl. B05b 1/24; B44d 3/42
U.S. Cl. 239—135 7 Claims

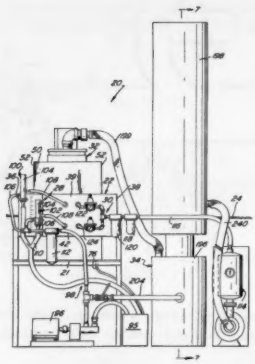


A liquid heating feedback system for elevating the temperature above the dew point of the liquid feed to a heat exchanger of a liquid heating system, particularly of the "once-through" type wherein the liquid feed is not recirculated through the heat exchanger. A Venturi injector is employed to permit the feedback of a portion of the heated liquid from the heat exchanger to be commingled with the liquid feed being pumped to the heat exchanger. By preheating the liquid feed up to the dew point prior to being fed into the heat exchanger, the formation of condensate on the surfaces of the heat exchanger can be practically eliminated, thereby extending the useful life of the heat exchanger, burner and associated combustion components.

3,814,322
MIST COATING OF STRIP MATERIAL

John E. Waldrum, Ambler, Pa., assignor to Anchem Products, Inc., Ambler, Pa.

Filed July 12, 1973, Ser. No. 378,766
Int. Cl. B05b 3/06, 7/04, 15/04
U.S. Cl. 239—251 17 Claims



Apparatus for spraying an aerosol mist of a liquid onto a moving strip to coat the strip and prepare it for subsequent painting.

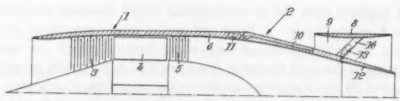
The apparatus comprises a spray chamber in which a pair of rotating spray heads are disposed and through which the strip passes between the spray heads. The spray heads each include plural nozzles which rotate under the jet action of the exhausting aerosol to provide a fine aerosol mist which uniformly coats the moving strip. No liquid tight seals are used in the spray heads and the liquid for the aerosol is directed without leakage to the spray nozzles by centrifugal force.

Exhaust means are provided to maintain a slight vacuum within the chamber and to preclude the egress of the coating liquid or vapor therefrom. A liquid bath filter is provided to filter the exhausted atmosphere from the chamber and a surface filter is provided to filter the atmosphere from the liquid bath and to release it to the ambient atmosphere.

3,814,323
JET PROPULSION ENGINES FOR SUPERSONIC AIRCRAFT OR VEHICLES

Jacky R. Leynaert, Igny, and Bernard J. Mechin, Fontenay-aux-Roses, both of France, assignors to Office National D'Etudes Et De Recherches Aerospatiales, Chatillon-Sous-Bagneux, France

Filed Dec. 15, 1972, Ser. No. 315,338
Claims priority, application France, Jan. 6, 1972, 72.369
Int. Cl. B63h 25/46; B64c 15/10
U.S. Cl. 239—265.17 19 Claims

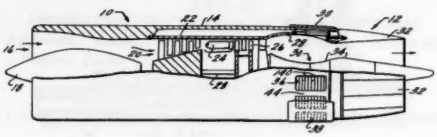


These engines have a front part shielding a gas generator and a rear part constituted by an exhaust nozzle. The exhaust nozzle comprises a streamlined element, doors and flaps, the doors and the flaps being arranged to occupy different configurations according to the conditions of flight. The invention is particularly useful for jet propulsion engines for supersonic aircraft.

3,814,324
PROPULSION NOZZLE AND ACTUATOR SYSTEM EMPLOYED THEREIN

Robert Price Wanger, Fairfield, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed June 19, 1972, Ser. No. 264,394
Int. Cl. B64d 33/04; B64c 9/38
U.S. Cl. 239—265.31 7 Claims

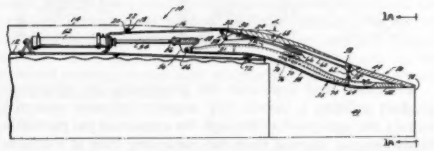


A propulsion nozzle is described in combination with a gas turbine engine. The hot gas stream of the engine is discharged through the nozzle for forward propulsion, or may be discharged laterally thereof for reverse thrust. The nozzle is of the variable geometry, plug type wherein flaps are pivotal to vary the discharge and throat areas thereof for different flight conditions spanning subsonic and supersonic operation. The flaps for controlling discharge area are pivotally mounted on a frame which is longitudinally displacable to uncover ports in the sides of the pod or nozzle structure. The hot gas stream may then be laterally and forwardly discharged therethrough for reverse thrust. Axial movement of this frame is controlled by a set of first actuators. Pivotal movement of the flap is controlled by a set of second actuators. The first and second set of actuators are sequentially interconnected in such a fashion that both sets may be powered from a single source of pressurized hydraulic fluid through "hard" conduits. Valves are employed to enable independent operation of each set of actuators in providing the varying thrust capabilities of the nozzle.

3,814,325
VARIABLE AREA CONVERGENT-DIVERGENT EXHAUST NOZZLE

Arthur McCardle, Jr.; Robert Lee Sponseller, both of Cincinnati, and Charles Henry Gross, Lebanon, all of Ohio, assignors to General Electric Company, Lynn, Mass.

Filed June 18, 1973, Ser. No. 371,056
Int. Cl. B64d 33/04; B64c 9/38
U.S. Cl. 239—265.39 10 Claims

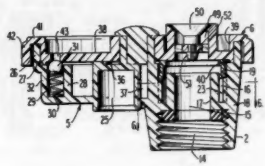


A simple variable area convergent-divergent exhaust nozzle is provided for an aircraft propulsion system for operation at both subsonic and supersonic aircraft speeds. The variable area exhaust nozzle comprises a system of inner primary flaps which may be simultaneously pivoted and translated about the nozzle axis so as to define a first convergent slightly divergent nozzle suitable for efficient subsonic operation and a second convergent-divergent nozzle suitable for efficient supersonic operation. A system of outer secondary flaps are arranged to pivot in cooperation with the primary flaps so as to define an outer surface which incurs a low external drag through all modes of flight operation.

3,814,326
SPRAY NOZZLE

Lawrence D. Bartlett, Rt. 2, Hartford, Ky. 42347

Continuation-in-part of Ser. No. 133,556, April 13, 1971, Pat. No. 3,711,029. This application Dec. 7, 1972, Ser. No. 312,839
Int. Cl. A62c 31/22
U.S. Cl. 239—276 15 Claims

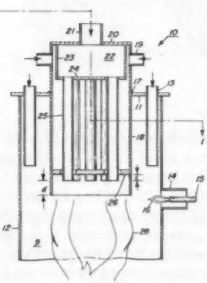


A nozzle assembly intended to be hand held at the end of a water hose or supported on top of a stake inserted in the ground has a main body portion and a nozzle plate rotatably supported on the main body portion. The nozzle plate has a plurality of nozzle orifices of different sizes or characteristics indexable in front of an outlet port in the main body portion. Sealing means, recesses and other features are provided to prevent water from squirting at a user while he holds the nozzle assembly and indexes the nozzle plate to present different nozzle orifices to the outlet port.

3,814,327
NOZZLE FOR CHEMICAL REACTION PROCESSES

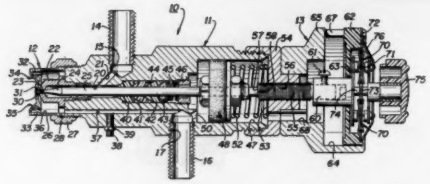
Abdul G. Dada, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Apr. 6, 1971, Ser. No. 131,684
Int. Cl. B05b 7/00
U.S. Cl. 239—290 15 Claims



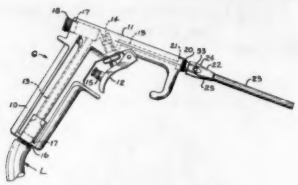
A nozzle for injecting fluid reactants into a reaction zone is presented in various embodiments. The nozzle is held by a supporting means and has a first inlet means for receiving and guiding a first fluid reactant into the reaction zone. The nozzle has a second inlet means for receiving and guiding a shielding fluid into the reaction zone for temporarily separating the fluid reactants entering the reaction zone. A third inlet means is disposed and slightly recessed within the second inlet means and has a chamber for receiving a second fluid reactant which chamber is connected preferably to a plurality of tubular members for guiding the second fluid reactant into the reaction zone. A directional control plate is secured transversely in the second inlet means and this plate is provided with openings through which the plurality of tubular members extend coaxially forming an annular opening around each tubular member enabling the shielding fluid in the second inlet means to flow unidirectionally through the annular openings and then into the reaction zone.

3,814,328
SPRAY GUN
Walter B. Warning, 2424 N. Nordica Ave., Chicago, Ill. 60635
Filed Apr. 16, 1973, Ser. No. 351,135
Int. Cl. B05b 1/30
U.S. Cl. 239—411 **6 Claims**



A spray gun includes a unitary housing having a nozzle assembly mounted at the front and a vernier adjustment assembly mounted at the rear for controlling the liquid flow from the nozzle.

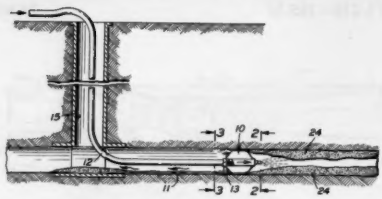
3,814,329
PRESSURE REDUCING NOZZLES FOR PRESSURE GUNS
James T. Clark, 118 W. Railroad Ave., Fort Morgan, Colo. 80701
Filed Dec. 4, 1972, Ser. No. 311,693
Int. Cl. B05b 1/32
U.S. Cl. 239—426 **6 Claims**



A pressure reducing nozzle for a pressure gun of the type which discharges a jet of air for cleaning and blowing away purposes. When air pressure guns are used with an air supply in the range of 100 to 125 P.S.I., a means for reducing the effective pressure of the jet discharged from the pressure gun is necessary. The present invention is a two-stage pressure reducing nozzle which is fitted to the vent of a pressure gun. A short tube is located at the entrance of the passageway of the pressure reducing nozzle. The entrance end of this tube is reduced in diameter to form a restrictive orifice and to create a first stage of pressure reduction within the tube. The exit end of this tube is also reduced in diameter to form a second restrictive orifice and to create a second stage of pressure reduction within the passageway of the pressure reducing nozzle downstream from the tube. A vent in the passageway at this tube aides in forming the second stage pressure reduction.

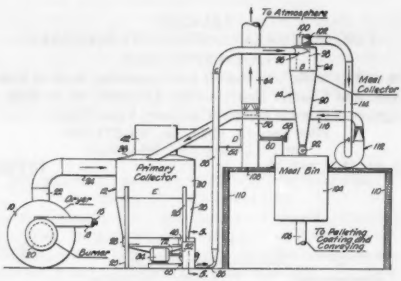
3,814,330
NOZZLE
Philip C. Masters, Ashland, Ohio, assignor to McNeil Corporation, Akron, Ohio
Filed Mar. 1, 1973, Ser. No. 336,971
Int. Cl. B05b 1/14
U.S. Cl. 239—558 **12 Claims**

A nozzle for cleaning the inside of piping, such as sewer lines and the like, receives high pressure water from a hose attached to the back thereof. The water is emitted from a front port or jet to dislodge debris clogging the pipe. The body of the nozzle is fluted thereby being divided into a series of vanes to permit the passage of loosened debris through the flutes and toward the rear of the nozzle. Each vane includes a plurality of thrust ports or jets mounted on a surface angular to the circumferential extremity of the nozzle and emitting water



generally rearwardly to drive the nozzle and hose through the pipe. Each vane also includes a flusher port or jet which is mounted on a surface angular to both the circumferential extremity of the nozzle and the surface of the thrust port and which has an axis askew to the axis of the nozzle to create a volute flow of water to clear debris or sediment adhering to the inside of the pipe.

3,814,331
METHOD OF PROCESSING CROPS IN A CLOSED LOOP SYSTEM UNDER NEGATIVE PRESSURE
Richard L. Ronning, Overland Park, Kans., assignor to Ronning Engineering Co., Inc., Overland Park, Kans.
Division of Ser. No. 91,628, Nov. 23, 1970, Pat. No. 3,771,294.
This application Sept. 19, 1973, Ser. No. 398,704
Int. Cl. B02c 21/00
U.S. Cl. 241—19 **4 Claims**



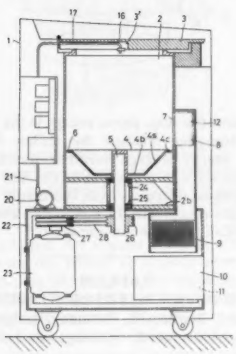
A method and apparatus for processing an agricultural product utilizing a closed loop negative pressure system to convey the agri-product through the apparatus yet permitting ready removal thereof from the conveying loop at a selected location. The undehydrated product is dried in a hot gas dryer and then conveyed under the influence of a negative pressure-inducing blower, into a frusto-conical primary collector where the product, dust, and other light particles are separated from the conveying media. The primary collector-separator is maintained under a negative pressure by the aforementioned blower which also facilitates removal of the lighter foreign material. As a result of the frustoconical configuration of the collector-separator and its tangential material inlet and outlet, superior separation is achieved and the agri-product and particulates are maintained in motion and conveyed into mill hammer nill conductor under the influence of another negative pressure-inducing blower. A metal collector which is located adjacent to and on the negative pressure side of the

latter-mentioned blower receives the comminuted agri-product from the hammer mill and separates it from the adjacent blower airstream. The output of the adjacent blower is directed back to the primary collector-separator for recirculation through the apparatus.

3,814,332
APPARATUS FOR CRUSHING FRAGILE MATERIAL

Kazutoshi Nakao, 8, Tsuruha-cho 1-chome, Showa-ku, Nagoya, Japan

Filed Aug. 21, 1972, Ser. No. 282,010
Int. Cl. B02c *19/00*
U.S. Cl. 241—38 **9 Claims**



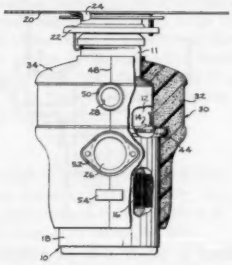
An improved apparatus for disposing of broken articles, especially broken pieces of fragile material, such as glass, glassware, pottery and earthernware. According to this invention, a large quantity of such material can be disposed of continuously without stopping the operation; the dust produced while the material is being crushed can quickly be settled down, so that immediately upon completion of the crushing operation, the apparatus may be opened to discharge the crushed particles without contaminating the ambient air; sieve means is provided for separating uncrushable articles, such as metal and plastic pieces, from the crushed material; and the crushing means is so shaped and disposed relative to the chamber housing the means that no vacant space is formed between the means and the chamber to allow any of the material getting jammed with the crushing means and preventing its smooth operation.

3,814,333
FOOD WASTE DISPOSER WITH OUTER WRAPPER

James J. Sapienza, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 26, 1972, Ser. No. 318,032
Int. Cl. B02c *18/40*
U.S. Cl. 241—46 B **5 Claims**

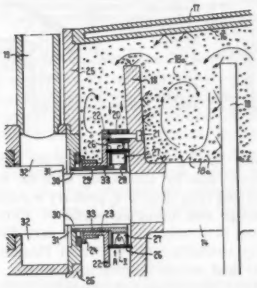
A food waste disposer unit is provided with a removable and replaceable one-piece outer shell. The outer shell is a semi-rigid resilient vibration-absorbing cover formed from a foamed polymeric resinous material such as foamed polyurethane. The shell has inner and outer closed surfaces or skins defining a cellular core therebetween and is provided with a top to bottom separation through the side wall thereof to permit it to be temporarily deformed whereby it can be positioned in snug fitting relationship about the food waste disposer unit.



3,814,334
COLLOID MILL

Friedrich G. Funk, Refugium, 4713 Matzendorf, Switzerland

Filed July 14, 1972, Ser. No. 271,644
Claims priority, application Switzerland, July 26, 1971, 10942/71; May 26, 1972, 7796/72
Int. Cl. B02c *17/16*
U.S. Cl. 241—70 **14 Claims**



A colloid or stirring mill in which the material to be treated mixed with millbodies, e.g. glass, ceramical or synthetic pearls, is moved in a container by means of one or more rotating milling members, the treated material being discharged through a sieve or filter eliminating the millbodies or pearls, the filter being rotated for avoiding choking of the filter.

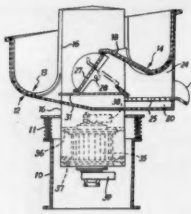
3,814,335
VIBRO-GYRATORY MILLS

Dennis Fahey, Newcastle-Under-Lyme, and David Cunningham-Smith, Harpenden, both of England, assignors to William Boulton Limited, Burslem, Staffordshire, England

Filed Oct. 5, 1972, Ser. No. 295,388
Claims priority, application Great Britain, Oct. 9, 1971, 47097/71
Int. Cl. B02c *9/04*
U.S. Cl. 241—69 **9 Claims**

Vibro-gyratory mills for grinding or finishing purposes having a process chamber of annular shape in plan with a spiral floor and a separating chamber located beneath the upper end of the floor, there being a deflector member pivotally mounted at the region where the upper and lower ends of the floor meet, the deflector member being pivotally movable

between a recirculating position in which it forms a chute extending between the upper and lower ends of the floor and a



discharge position in which it forms a chute directing the charge from the upper end of the floor to said separating chamber.

3,814,336

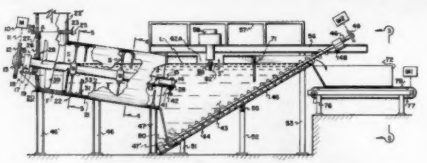
HYDROPULPER AND CLASSIFIER EQUIPMENT

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed June 14, 1972, Ser. No. 262,922

Int. Cl. B02c *13/10*

U.S. Cl. 241—79.1 **9 Claims**



A hydropulper having spiral structure for feeding into a pulping region and also for classifying, with the use of a self-contained revolving rake structure, primary materials found in household garbage and municipal waste. A vibrating screen structure is used in connection with the rake for separating water and pulp contained therein from floatables such as plastics, rubber and wood. Non-ferrous metals, rock, sand, glass, and so forth, are conveyed upwardly, underneath and past a rake area partition means, so as to be deposited onto conveyor structure. The input pulping mechanism is constructed for ease of revolving drum pulper structure removal, cleaning and maintenance. Valve means control water level for a variety of purposes. The rake structure is preferably inclined and also cam or otherwise elevated proximate the discharge region.

3,814,337

APPARATUS FOR FRAGMENTING GLASS

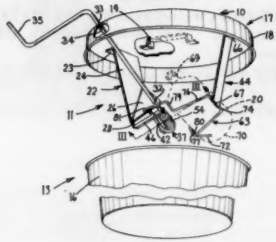
Adrian Dean Vander Jagt, 4075 State St., Bridgeport, Mich. 48722

Filed Mar. 29, 1972, Ser. No. 239,222

Int. Cl. B02c *19/14*

U.S. Cl. 241—99 **13 Claims**

A glass container compacting device particularly adapted for breaking or smashing glassware, particularly glass containers such as bottles to reduce same to fragments capable of occupying a substantially reduced volume. The apparatus comprises a cradle for supporting the glass container fixedly within a closed receptacle for shielding the operator during breaking and for receiving the resultant fragments. A shaft is located within the receptacle and connects to a motive power source which may be a manually actuable crank located outside the receptacle. A striker is eccentrically mounted on the shaft and within the receptacle for movement along a path through the glass container and is coupled to an energy storage member. A rest or stop prevents movement of the striker toward the bottle during storage of energy in said energy storage member. After loading of the bottle onto the cradle and closure of the receptacle, rotation of the shaft positions



the striker against the stop, stores energy in the energy storage means and thereafter releases the striker from the stop whereby the energy storage member forcibly impels the striker into contact with the bottle or the like to fragmentize same, the fragments dropping from the cradle into a position of storage in the receptacle. In a modified embodiment, the stop is eccentrically mounted on the shaft.

3,814,338

SPOOLING DEVICE WITH PRE-WINDING MEANS

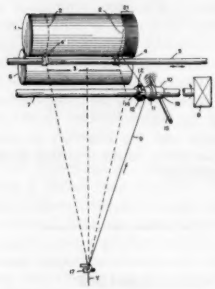
Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed June 1, 1972, Ser. No. 258,869

Claims priority, application Germany, June 4, 1971, 2127793

Int. Cl. B65h *54/02*

U.S. Cl. 242—18 PW **9 Claims**



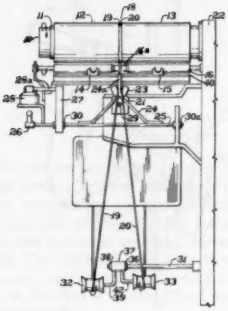
A spooling device for winding a thread package on a rotatable carrier with a pre-winding means to form an initial winding and/or thread reserve at one end of the carrier adjacent the normally wound package, this pre-winding means including a multi-flanged cylindrical thread guide element rotatable into open positions consisting of circumferentially removed portions of the individual flanges which permit the running thread to slide axially along the circumferential thread-contacting surface of the guide element past each flange.

3,814,339

TRANSFER MECHANISM FOR HIGH SPEED WINDERS

Ben Avery Hudson, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 16, 1972, Ser. No. 298,086
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 PW 5 Claims



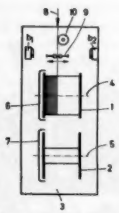
A method and apparatus are described for producing a transfer tail on precision wound packages with the transfer tail being made at the same speed and under the same conditions as the other textile material placed on the package. The invention is described with specific reference to the winding of fiber glass strand packages. An angular guide is utilized to automatically position the strand or strands over a traversing mechanism guide eye which allows the threading of the yarn in the guide eye without interruption of the normal movement of the yarn or yarns being wound. The system may be manually or automatically operated so that the transfer tail is not applied to the packages until operating speeds are obtained on the textile package to be wound, thus providing for the same character of yarn on the transfer tail as on the subsequently wound yarn.

3,814,340

CONTROL DEVICE FOR THE TRANSFER OPERATION OF A DOUBLE COIL-WINDER

Charles Maillefer, Renens, Switzerland, assignor to Maillefer S.A., Vaud, Switzerland

Filed Dec. 21, 1972, Ser. No. 317,124
Claims priority, application Switzerland, Dec. 23, 1971, 18863/71
Int. Cl. B65h *54/02*
U.S. Cl. 242—25 A 6 Claims



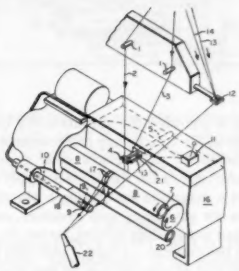
A device for controlling the transfer operation of wire from one spool to the next in an automatic double coil-winder provided with a traverse winding mechanism which moves alternately in a back-and-forth motion along the entire width of the spools, starting from one of their ends where wire-catching means are located. It comprises a counter capable of continuously counting the length of paid-out wire, means for doubling the counter's counting rate and for stopping the counter from functioning during the back travel of the traverse winding mechanism, a control element actuated by the counter when the predetermined length of wire has been counted which causes a reversal of the sense of travel of the traverse winding mechanism, and means for initiating the transfer operation which is actuated when the traverse winding mechanism reaches the end of its back travel following that final reversal of its direction of motion.

3,814,341

YARN WINDING APPARATUS

Frederick Stoever Dickson, III, Hockessin, Del., and Warren Lee Williams, Columbia, S.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 7, 1973, Ser. No. 395,229
Int. Cl. B65h *54/02, 65/00*
U.S. Cl. 242—35.5 R 3 Claims



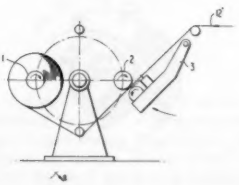
A yarn windup having two abutting yarn package supports per chuck in which two yarns are held near the abutting ends of the supports by retractable guides until the yarns are cut by a cutter. Transfer tails are then wound as the retractable guides are moved away from yarn engagement releasing the yarn into traverse guides to begin normal traverse winding. Optionally, the retractable guides are shaped so that during release of the yarn, they momentarily move the yarn slightly toward the abutting ends of the tubes to cross over and trap the cut yarn ends.

3,814,342

AUTOMATIC WEB TAKING-UP DEVICE

Kiyoharu Fujiwara, Minami Ashigara-machi, Japan, assignor to Fuji Photo Film Co., Kanagawa, Japan

Filed Dec. 29, 1971, Ser. No. 213,489
Claims priority, application Japan, Dec. 29, 1970, 45-121441
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 A 2 Claims



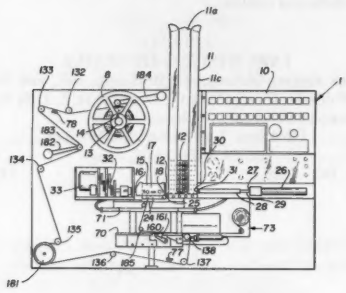
An automatic web taking-up device has a core disposed at one side of the travelling web for taking up the web, a press roller disposed oppositely to the core at the other side of the web, and a travelling cutter disposed in series with the press roller at the side where the web is fed into the nip between the input press roller for cutting the web.

3,814,343

AUTOMATIC TAPE LOADING APPARATUS FOR CASSETTES AND THE LIKE

William P. Bennett, and Jacob Haller, both of Northbrook, Ill., assignors to Programming Technologies, Inc., Chicago, Ill.

Filed Oct. 10, 1972, Ser. No. 296,255
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 R **46 Claims**



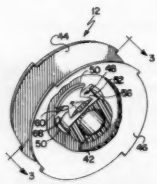
An apparatus is provided for automatically loading a plurality of cassettes of the type having two rotatable spools and a leader tape connecting said spools with a predetermined length of magnetic tape or the like from a supply reel. The apparatus includes a magazine for storing a plurality of empty cassettes, means for advancing said cassettes, one at a time, from the magazine to a loading station, means for withdrawing the leader from the cassette, cutting it into two sections, and splicing the free end of one section to the leading end of a length of supply tape, means for automatically rotating one of the spools of said cassette to wind the spliced leader section and a predetermined length of said supply tape into said cassette, and means for cutting the supply tape after said predetermined amount has been wound into the cassette and splicing the trailing end thereof to the free end of the other leader section. Means are also provided to eject the fully loaded cassette from the apparatus and recommence the tape loading cycle with the following cassette stored in the magazine.

3,814,344

FILM REEL WITH A CHORDAL CONNECTION SLOT

Gerald H. Cook, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 15, 1972, Ser. No. 253,063
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **21 Claims**



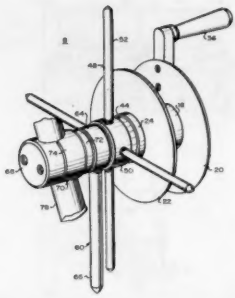
A film reel having a chordally arranged slot for connecting the film reel with the end of a strip of film. The slot contains a barb which cooperates with an aperture formed at the end of the film strip. Once the film strip end is placed within the slot, and the barb engages the film strip aperture, accidental separation of the film end from the slot is obviated.

3,814,345

FISHING REEL WITH COAXIAL DRAG AND MOUNTING ASSEMBLIES

Matt Kropelnicki, 537 Cedar St., San Mateo, Calif. 94070

Filed Feb. 7, 1972, Ser. No. 223,884
Int. Cl. B65h *75/38, 75/30*
U.S. Cl. 242—106 **5 Claims**



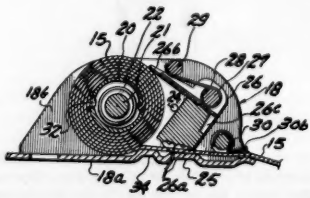
A reel assembly, an adjustable drag assembly for applying an adjustable drag to opposite sides of the reel assembly, and a reel mounting assembly for removably mounting the reel and adjustable drag assemblies on a pole and for releasably locking them in place on the pole are coaxially mounted on a reel shaft. The adjustable drag assembly includes a first friction disc positioned adjacent to one side of the reel assembly, and a second friction disc positioned adjacent to a spacer disc at the other side of the reel assembly. It also includes a first pressure plate positioned adjacent to the first friction disc, and an adjustable second pressure plate positioned adjacent to the second friction disc and provided with a plurality of angularly spaced drag adjustment bars. The reel mounting assembly includes a pair of clamping members, and a quick-release locking lever positioned between the adjustable second pressure plate and these clamping members.

3,814,346

RETRACTABLE SAFETY BELT DEVICE

Martin L. Carter, 568 D. Lynn Court, Glendale Heights, Glen Ellyn, Ill. 60137

Filed Oct. 20, 1965, Ser. No. 498,765
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.2 **16 Claims**

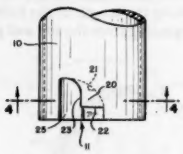


A safety belt apparatus for use in vehicular transportation, including a belt, a spool for retractably storing the belt, and a clamp which engages the belt and allows for automatic adjustment of the belt to fit the user.

3,814,347
STARTING DEVICE FOR YARN CARRIER

Hugh G. Moren, Jr., Taylors, S.C., assignor to Baldt Corporation, New York, N.Y.

Filed June 19, 1973, Ser. No. 371,557
Int. Cl. B65h *75/28*
U.S. Cl. 242—125.1 **2 Claims**

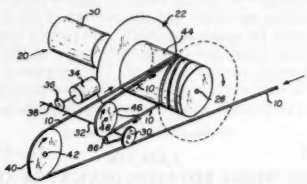


A cylindrical yarn carrier on which yarn is wound at high winding speeds to form a yarn package is provided with a start-up device comprising an approximately tangentially disposed undercut yarn entrapping flap integrally formed in the wall of the yarn carrier at the outer surface and adjacent one end thereof. The rearward end of the flap is integral with the wall of the yarn carrier and the forward end and one longitudinal edge of the flap is undercut and open to receive a strand of yarn thereunder.

3,814,348
LAYER WINDING WIRE USING AN ELECTRIC EYE AS A CONTROL

James C. Johnson, St. Louis, Mo., assignor to General Cable Corporation, Greenwich, Conn.

Filed Sept. 18, 1972, Ser. No. 290,248
Int. Cl. B65h *54/28*
U.S. Cl. 242—158 R **13 Claims**



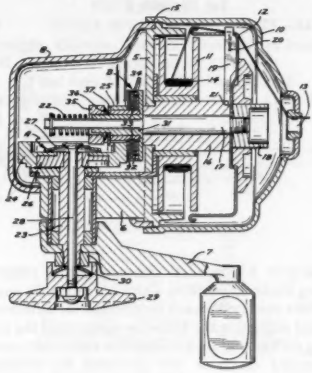
This apparatus winds wire on a reel in layers and controls the winding by the traverse movement of sheaves over which the wire passes on its way to the reel. A first guide sheave is traversed mechanically but its position is controled by a proximity switch. After passing over the mechanically traversed guide sheave, the wire travels around a free floating guide sheave, and then around the reel ahead of the layer of wire that is being wrapped. The wire or cable then travels back to a second free floating sheave that moves according to the winding of the wire of each layer on the reel. The shift of this second free floating sheave controls the mechanical traverse in accordance with the movement of a light beam which is responsive to the movement of the second free floating sheave.

3,814,349
DUAL DRAG FOR FISHING REELS

Eugene P. Menne, Mankato, Minn., assignor to Johnson Diversified, Inc., Mankato, Minn.

Filed June 30, 1972, Ser. No. 268,155
Int. Cl. A01k *89/02*
U.S. Cl. 242—217 **5 Claims**

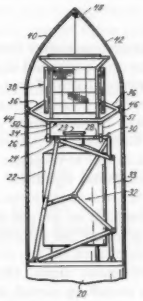
A dual drag drive mechanism for a fishing reel having a driving shaft for a line spooling member, a crank shaft for rotating the driving shaft, a pair of friction drag units one associated with each of said shafts, and means for independently and selectively adjusting the resistance produced by each of the units. The drag unit for the crank shaft is operative, by releasing winding pressure on the crank shaft, to permit slippage when the fisherman wants to allow the fish to run under tension that is determined by a star wheel adjustment. The drag unit for the driving shaft is operative to permit slippage in either direction at a pre-set degree of resistance below the tension limit of the line selected for use in the reel.



3,814,350
THRUST-ISOLATING MOUNTING

James C. Fletcher, Adminstrator of the National Aeronautics and Space Administration with respect to an invention by, and Dallas G. Wetzler, 1575 Bluff Dr., Florissant, Mo. 63031

Filed Mar. 21, 1973, Ser. No. 343,607
Int. Cl. B64g *1/10*
U.S. Cl. 244—1 SS **13 Claims**



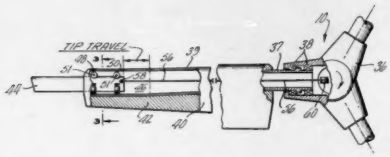
A supporting frame for a load, such as one or more telescopes, is isolated from all multi-gravitational forces, which will be developed within that load as that load is propelled into space, by using a shroud to fully and solidly hold that load until that load has been propelled into space. Thereafter, that shroud will be jettisoned; and then supports which are on, and which are movable with, that load will have surfaces thereon moved into supporting engagement with complementary surfaces on that supporting frame to enable that supporting frame and those supports to fully and solidly hold that load.

3,814,351

COAXIAL ROTOR YAW CONTROL

Richard L. Bielawa, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 6, 1972, Ser. No. 312,450
Int. Cl. B64c *27/10*
U.S. Cl. 244—17.19 **9 Claims**



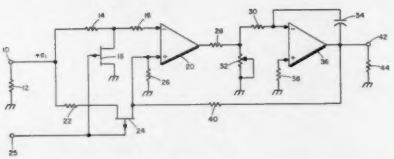
A helicopter has coaxial counterrotating rotors having telescoping blade tip portions which are normally partially extended. Pilot operated means is provided for differentially extending and retracting the blade tip portions of the two rotors producing differential torque between rotors for yaw control. Pilot operated means is also provided for simultaneously retracting the tip portions of the blades of both rotors.

3,814,352

REVERSING COMMAND MODIFIER

Alton O. Grimes, Ft. Lauderdale, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 17, 1973, Ser. No. 351,897
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 B **3 Claims**



A reversing command modifier circuit for a composite beam and course steering command in an aircraft flight controller uses two operational amplifiers to prevent abrupt command signal changes from causing abrupt aircraft maneuvers and additionally allows the composite command signal to be inverted in polarity when desired. A first operational amplifier operates as a current supply in response to an input composite beam and course command signal for an integrating circuit which includes the second operational amplifier. The results of the integration comprise an output command signal which can be applied to position the aircraft control surfaces. A negative feedback loop turns off the constant current supply when the output command signal attains a predetermined value. In addition, a switching circuit permits the input composite command signal to be switched at the input of the first operational amplifier thereby reversing the polarity of the output command signal.

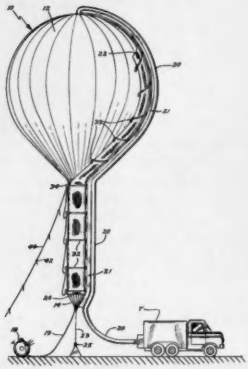
3,814,353

BALLOON REEFING SLEEVE AND LAUNCHING METHOD

Jean R. Nelson, St. Paul, Minn., assignor to Winzen Research Inc., St. Paul, Minn.

Filed Jan. 5, 1973, Ser. No. 321,238
Int. Cl. B64b *1/58*
U.S. Cl. 244—98 **10 Claims**

A method is described for launching high altitude research balloons which are often from about 300 – 500 feet in length. The balloon is extended on the ground its full length with its envelope restrained to a collapsed condition along its entire length except for a portion near the top. The restriction in the circumference of the balloon along its length causes the inflation gas to expand only the unrestricted portion of the top of the balloon to define a lifting bubble for elevating the entire balloon to an erect position while the bottom is secured to the ground. The balloon is filled from the top through a filling tube which runs along the length of the balloon. The restraint is then released beginning from the top and proceeding toward



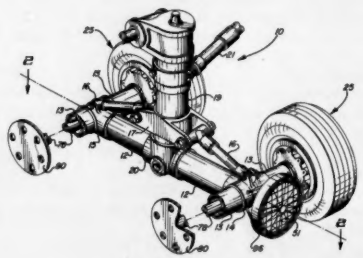
the base of the balloon as the inflation gas is introduced and in timed relationship with the introduction of the inflation gas so that the tension exerted upon the envelope of the balloon by the inflation gas will never exceed a predetermined limit during the filling operation and the portion of the balloon envelope below the expanding bubble will remain restricted to a substantially uninflated condition because of the continued circumferential restraint thereof. The restrained portion is reduced in size progressively proceeding downwardly until the balloon is sufficiently inflated for release from the ground.

3,814,354

LANDING WHEEL ROTATING DEVICE FOR AIRCRAFT

Lewis E. Reese, Phoenix, Ariz., assignor to Oldrich Drake, Phoenix, Ariz.

Filed May 14, 1973, Ser. No. 359,906
Int. Cl. B64c *25/40*
U.S. Cl. 244—103 S **18 Claims**

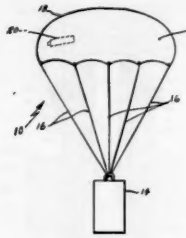


A power operated device associated with the conventional landing gear of an aircraft for causing rotation of the landing wheels of the aircraft by the air-stream moving past the aircraft prior to landing and while still airborne.

3,814,355
DESTRUCTIBLE PARACHUTE

William B. Pepper, Jr., and Robert J. Buxton, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Aug. 1, 1973, Ser. No. 384,530
Int. Cl. B61d *17/02*
U.S. Cl. 244—145 **1 Claim**

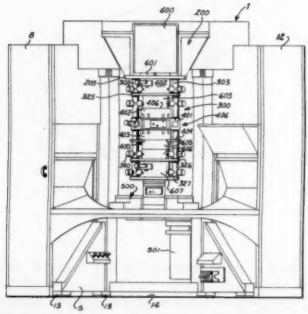


A destructable parachute including a canopy of a flammable material having a pyrotechnic coating thereon, a payload object and a plurality of suspension lines interconnecting the canopy and the payload object to provide for the suspension thereof.

3,814,356
ELECTRON MICROSCOPE

John W. Coleman, Prince St. & Strawbridge Rd., Northumberland, Pa. 17857; James J. McGinnis, RD No. 1, Milton, Pa. 17847; John R. Fairbanks, 735 Buffalo Rd., Lewisburg, Pa. 18102; Joseph J. Schuler, 836 Chestnut St., Mifflinburg, Pa. 17844; Patrick H. McLaughlin, 625 Pennsylvania St., Lewisburg, Pa. 18102; Andre A. Hoffman, 29 Jonathan Rd., Shamokindam, Pa. 17872; Kirk C. Newton, 114 E. Green St. Box 47, Mifflinburg, Pa. 17844, and George E. Johnson, Milton Rd. No. 1, Milton, Pa. 17847

Filed Oct. 2, 1970, Ser. No. 77,718
Int. Cl. F16f *7/00, 9/346*
U.S. Cl. 248—18 **12 Claims**

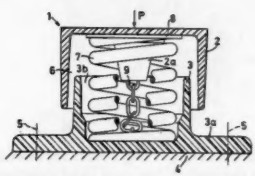


A vibration eliminating support system for a sensitive instrument. The support system includes a bearing which supports the instrument in pendulum fashion such that external vibrations and movement of the support are transformed to long period swinging motion of the instrument. This prevents relative movement of the parts of the instrument with the result that vibrations and shock have no effect on the accuracy of the instrument. The support system has particular utility for vibration isolation of a rigid column of an electron microscope which is suspended on the bearings for pivotal movement. Advantageously, the bearings are air bearings to maintain friction of the bearing surfaces at an absolute minimum.

3,814,357
STEEL SPRING INSULATOR

Peter Rontgen, Giessen, Germany, assignor to Isoliertechnik Horst Grassmann, Frankfurt/Main, Germany

Filed Apr. 21, 1971, Ser. No. 135,946
Claims priority, application Germany, Apr. 22, 1970, 2019348
Int. Cl. F16j *15/00*
U.S. Cl. 248—20 **15 Claims**

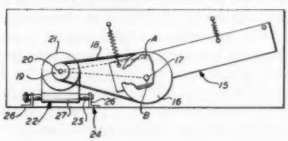


A steel spring insulator, to enable machines or sets of machinery, particularly fans, ventilators, blowers etc., to be installed in such a way that they will be insulated from vibrations and protected from sound conducted through solids, the said insulator comprising a lower portion firmly affixed to the bearing surface of a foundation or a supporting structure, and an upper portion affixed underneath the base of the machine or set of machinery or underneath a bearer thereof, at least one steel helical compression spring being provided between the said two portions and being surrounded by the upper and/or lower portion on all sides and with ample clearance, at least one connecting element being provided which interconnects the upper and the lower portion and keeps the compression spring in a prestressed state, wherein the connecting element consists of at least one flexible traction means which is affixed by one end portion to the lower part and by the other end portion to the upper part and of which the length is such that when the insulator is not subjected to a load the traction means is loaded and the compression spring is slightly prestressed, said traction means being relieved of its load and hanging loosely not later than when the insulator has reached its minimum permissible loading.

3,814,358
MOTOR BASE WITH SHOCK-ABSORBING SLIDABLE CARRIAGE

Jerome J. Sloyan, c/o Automatic Motor Base Company, Windsor, N.J. 08561

Filed May 27, 1971, Ser. No. 147,372
Int. Cl. F16m *3/00*
U.S. Cl. 248—23 **2 Claims**

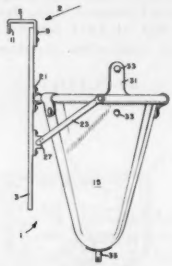


A motor base assembled with cross-members welded directly on flat areas of the slidable bearings and the base making provision for substantially even spring tension during periods of subjection to vibration imposed on the base by gyration of the driven pulley.

3,814,359
CHILD'S CLOTHES BAG HOLDER

Ann Joyce Powell, RD No. 1 Box 12, Greenville, N.Y. 12083

Filed Apr. 9, 1973, Ser. No. 349,308
Int. Cl. B65b 67/12
U.S. Cl. 248—99 7 Claims

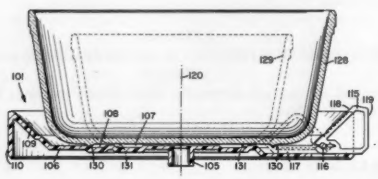


Discloses a child's clothes bag holder for storing soiled and dirty clothes in the clothes bag, said child's clothes bag holder comprising a backboard, hook members, a strap bracket, a hoop, a bail, a bail bracket and a clothes bag. The backboard carries the hook members, strap bracket and bail bracket. The hook members are adapted to fit over the top of a door and against same to removably mount the backboard on the door, the strap bracket pivotally mounts the hoop, the hoop pivotally mounts the bail, the bail bracket removably receives the bail, and the clothes bag is detachably mounted on the hoop.

3,814,360
BOWL SUPPORTING TURNTABLE FOR KITCHEN MIXER

Maurice P. Samuelian, Sr., West Hartford, and Gerald E. Rideout, South Windsor, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed June 23, 1972, Ser. No. 265,846
Int. Cl. B01f 9/10
U.S. Cl. 248—131 7 Claims

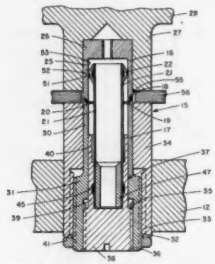


A turntable is disclosed for supporting a plurality of types and sizes of bowls in such a manner that the axis of rotation of the turntable and the center line of the bowl are substantially coincident. The turntable includes one or more concentric grooves which are proportioned to mate with the feet of one type of bowl which may be supported on the turntable. A second type of bowl which may have a smooth or flat bottom is retained on the turntable by a plurality of selectively adjustable retaining members which contact an outer edge of the bowl and maintain the bowl's alignment on the turntable. The selectively adjustable members may be retained in the selected position by any convenient means such as detents. In one embodiment the members are triangular shaped wedges which may be selectively pivoted between first and second positions for retaining smooth bottomed bowls of first and second different diameters, respectively.

3,814,361
DUAL-MODE CRYOGENIC SUPPORT SYSTEM

Frank Gabron, and John E. McCullough, both of Carlisle, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Sept. 29, 1972, Ser. No. 293,665
Int. Cl. F22b 37/24
U.S. Cl. 248—146 6 Claims

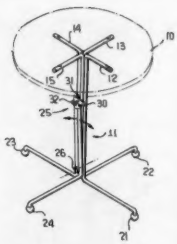


A cryogenic support system capable of operating in two modes: one being an isothermal mode during which time the cryogenic assembly being supported is subjected to stress, mechanical shock, acceleration or the like; the other being a "steady state" mode in which a rugged support is replaced by a less rugged arrangement exhibiting a very low thermal conductance.

3,814,362
ADAPTABLE SUPPORT FOR USE ON UNEVEN SURFACES

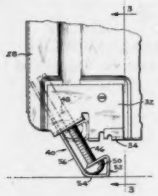
De W. Ritchie, 3016 N. Florida St., Arlington, Va. 22207

Filed Sept. 17, 1971, Ser. No. 181,530
Int. Cl. A47b 13/02
U.S. Cl. 248—188.3 7 Claims



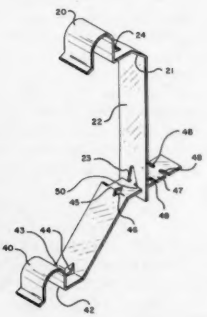
A four-point support for a table or the like is adapted to rest without wobbling on an uneven surface by securing an adjacent two of four legs together and mounting these two legs for pivotal motion in a plane perpendicular to the surface. When the support rests on an uneven surface the two pivoting legs are pivoted until all four legs rest on the surface; the pivoting legs are then locked in position to provide a stable, wobble-free four legged support. In an alternative embodiment the four-point support comprises a pair of spaced parallel pedestals, each having two support feet. One pedestal is rendered pivotable to permit its adaptation to uneven surfaces.

3,814,363
ANGLED LEVELLING FOOT FOR DOMESTIC APPLIANCE
Bernard J. Brelosky, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Dec. 22, 1972, Ser. No. 317,368
Int. Cl. A47l 15/42
U.S. Cl. 248—188.4 5 Claims



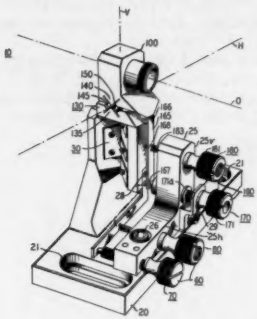
An adjustable levelling foot assembly for exceedingly simple design and economical construction for use in combination with a domestic appliance is disposed at an acute angle to the vertical in order to provide an accessability and ease of operation particularly valuable where the appliance is of the type adapted for built-in under counter installation or where the floor surface is carpeted.

3,814,364
BRACKET FOR PAINT CANS
Michael Gargaro, 129 Westover Dr., Cherry Hill, N.J. 08034
Filed Feb. 6, 1973, Ser. No. 330,012
Int. Cl. E06c 7/14
U.S. Cl. 248—210 1 Claim



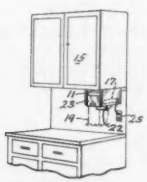
A two piece bracket for supporting a paint can from a ladder. One of the strips has a loop which passes over an upper rung of the ladder, a bent portion which is straight to engage a side of the paint can, a lanced portion between the loop and the bent portion and an opening at the other end adapted to join the other strip. A second strip having a loop at the one end adapted to go over a lower rung of the ladder and notches at the other end which are adapted to make a joint with the opening. In an alternate use the second strip has an extension which is adapted to form a portion going above the lower rung of the ladder and having opposite notches which will join the opening in the first strip reversed to support the paint can in front of the ladder.

3,814,365
ADJUSTABLE MIRROR MOUNT
Donald Reeve Mackenzie, Plainfield, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed July 3, 1972, Ser. No. 268,724
Int. Cl. G02b 7/00; A47g 1/24
U.S. Cl. 248—278 2 Claims



An adjustable mount for rotatably orienting a structure, such as an optical element, about two orthogonal axes comprises first and second orthogonal cross spring pivots and respectively associated first and second coarse-fine adjustment mechanisms. Each cross spring pivot includes a first member and a second member which is rotatable relative to the first member, these two members being connected by first and second interleaved flat leaf springs which intersect along the respective axis of rotation. Application of a torque to the second member, which has the optical element mounted thereon, causes rotation thereof relative to the first member about the axis of rotation. Utilizing at least five interleaved spring portions provides substantially improved mechanical stability.

3,814,366
APPLIANCE STORAGE APPARATUS
Earl Franklin Staifer, 1732 Glenn Ellyn Dr., Toledo, Ohio 43614
Filed June 8, 1972, Ser. No. 260,837
Int. Cl. A47b 88/00
U.S. Cl. 248—286 4 Claims



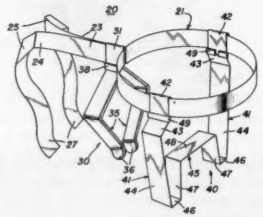
An appliance storage apparatus is disclosed. The apparatus comprises a frame which supports two opposing side walls. Arched track members are mounted in parallel relationship on the interior opposing side walls. A round projection, connected to the appliance to be stored, has its opposite ends in registry with the opposing arched tracks. The round projection is movable from an open front position of an enclosure, defined by the side walls, to a rear position in the enclosure along the opposing track members. The appliance is movable pivotally about the round projection from a horizontal position within the enclosure to a vertical, operating position when

the round projection is at a front position on the arched tracks. The appliance is stored within the enclosure by pivoting it to a horizontal position on the round projection and sliding the round projection to the rear position on the tracks. A support member on the appliance retains the appliance in a horizontal position when within the enclosure.

3,814,367
CUP HOLDER FOR AUTOMOBILE

Lester M. Rasmussen, 1361 Kensington Rd., Kankakee, Ill. 60901

Continuation-in-part of Ser. No. 38,746, May 19, 1970, Pat. No. 3,707,272. This application Sept. 29, 1972, Ser. No. 293,330The portion of the term of this patent subsequent to Dec. 26, 1989, has been disclaimed.
Int. Cl. A47c *7/70*
U.S. Cl. 248—311 **13 Claims**

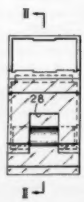


A cup holder includes a retaining ring having a pair of mounting arms extending substantially radially outwardly therefrom, the outer ends of the arms diverging and terminating respectively in downwardly extending prongs for insertion between the window pane and the inner ledge of an automobile door, a substantially diamond-shaped brace member slidably mounted on the mounting arms for movement therealong and into engagement with the inner surface of the automobile door, the brace member cooperating with the prongs for securely holding the carrier in place on doors of various thicknesses, and an integral flexible bottom support including a pair of hanger members respectively secured to the retaining ring at diametrically opposed points thereon and depending therefrom and interconnected at the lower ends thereof by a generally inverted U-shaped cross member resiliently displaceable to accommodate different sizes and weights of cups. A flanged rigid container may be hung within the retaining ring for accommodating the associated cup therein.

3,814,368
WALL MOUNTED SHEET HOLDER

Marvin J. Freed, 8 Leviton St., Tel Aviv, Israel

Filed Sept. 12, 1972, Ser. No. 288,316
Int. Cl. A47f *5/08, 7/16*
U.S. Cl. 248—316 R **5 Claims**

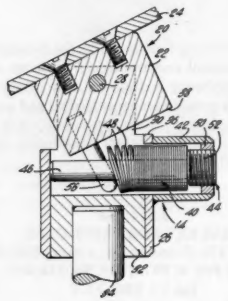


A wall mounted sheet holder comprises a mounting block carrying an adhesive layer on one face for fixing to the wall, and a holder unit including a plate formed at its upper end with a cutout or opening adapted to be received on the mounting block. The holder unit includes a hollow compartment having an inclined face, and a roller disposed within the compartment and guided by the inclined face to hold the sheet, when inserted into the compartment, between the roller and the plate. The sheet holder may include a plurality of the mounting blocks adapted to be fixed to the wall in spaced relationship, and at least two of the holder units each attachable to one of the mounting blocks to enable them to hold different size sheets.

3,814,369
TILTABLE SWIVEL CHAIR

Jorgen Kastholm, Tegnestue Vidnaesdal 18, 2840 Gl. Holte, Copenhagen, Denmark, and Harvey Probber, Guion Rd., Rye, N.Y. 10580

Filed Oct. 28, 1971, Ser. No. 193,349
Int. Cl. F16m *13/00*
U.S. Cl. 248—378 **11 Claims**

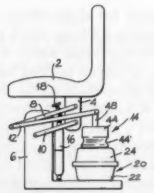


A tiltable swivel chair in which a seat is mounted on a pivot head for tiltable movement about a tilt axis which is normal to a vertical swivel axis. A housing which carries the pivot head also carries a series of compression washers engaging pins projecting from the pivot head to swing the latter forwardly around the tilting axis to a predetermined forward end position. The compression washers are distributed along a horizontal spring axis and the pins projecting from the pivot head compress the washers when the pivot head is swung rearwardly when the seat of the chair is tilted back. The tiltable swivel chair may also include compression washers distributed along a vertical spring axis and engaging stationary pins which project from the housing.

3,814,370
AIR CUSHION SUPPORTS FOR VEHICLE SEATS

Alexander Hurwitz, 33 Yavnieli St., Givatvaim, Israel

Filed June 26, 1970, Ser. No. 50,090
Int. Cl. F16m *13/00*
U.S. Cl. 248—400 **2 Claims**



An air-cushion support for vehicle seats comprises an air-filled chamber closed at its upper end by a flexible diaphragm

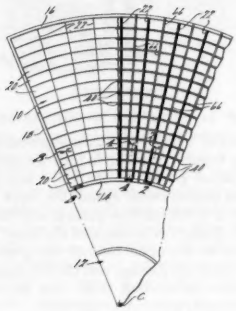
and at its lower end by a rigid base member, a plunger resting on the flexible diaphragm and supporting the vehicle seat, and a spring urging the diaphragm and seat to their upper positions. The air-filled chamber is under normal atmospheric pressure during the unoccupied condition of the vehicle seat and includes a normally closed valve and an operator therefor to vent the chamber interior to the atmosphere when the diaphragm is in its upper non-deflected position.

3,814,371

STRUCTURAL NETWORK FOR MAKING COMPOSITE CONCRETE TIERS

Joseph J. Locricchio, Bloomfield Hills, Mich., assignor to Indusco Corporation, Troy, Mich.

Filed Oct. 27, 1972, Ser. No. 301,432
Int. Cl. B28b *7/22*
U.S. Cl. 249—14 **6 Claims**



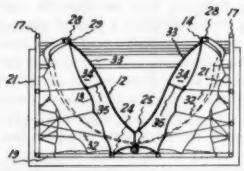
A combination concrete pouring form and concrete reinforcing network and a method of using the network for building reinforced tiered concrete structures, such as amphitheaters, stadiums, stairs and the like. The reinforcing network includes a plurality of longitudinally extending reinforcing elements, each having an upstanding sheet metal web provided with a saw-tooth pattern assembled from a series of triangular sections which serve to accurately locate the treads and risers of the tiered structure and additionally provide reinforcement and a control against the propagation of cracks through the final structure.

3,814,372

OPEN-TOP SHELL MOLDING APPARATUS

William John Taylor Western, 4 Elston Ave., Denistone, N.S.W., Australia

Filed June 21, 1972, Ser. No. 265,009
Claims priority, application Australia, June 22, 1971, 5261/71; June 29, 1971, 5353/71; June 23, 1971, 5654/71
Int. Cl. B28b *7/32*
U.S. Cl. 249—65 **10 Claims**



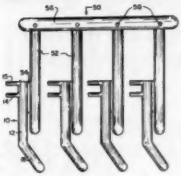
This invention is directed to a moulding apparatus for use in the formation of open-top bowl-like shells wherein at least some of the external surface is curved, which comprises a pliant form layer, which form layer may assume the shape required of said external surface; a top rail member which conforms to the shape required of the shell rim bordering said curved surface and to which the upper edge of said top rail member in conformity with said required rim shape; a pliant envelope spaced from and externally surrounding the form layer, wherein said pliant envelope with said form layer form at least one enclosure; and means to vary the fluid pressure within said enclosure.

3,814,373

CORE APPARATUS FOR MOLDING NASAL CANNULAE

Harold R. Havstad, Lakewood, Calif., assignor to Hudson Oxygen Therapy Sales Co., Temecula, Calif.

Division of Ser. No. 126,452, March 22, 1971, Pat. No. 3,731,900. This application Feb. 9, 1972, Ser. No. 331,186
Int. Cl. B28b *7/28*
U.S. Cl. 249—176 **8 Claims**



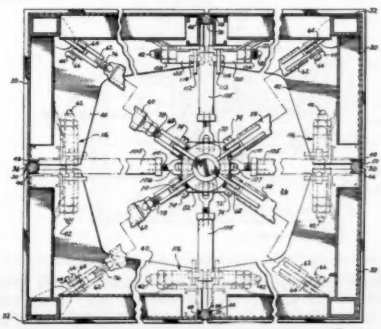
A flexible nasal cannula having improved characteristics is produced in a mold cavity incorporating a forming means comprising a transverse core having straight upper portion and a lower portion extending at an angle from the upper portion and a nipple core portion comprising a pair of rod-like extensions located toward the upper end of the upper portion and which extend substantially perpendicular to its axis. In a molding process, the forming means is maintained in special relation within a mold cavity, a thermoplastic material is flowed within the cavity around the forming means, cooled sufficiently to set the material and thereafter the cannula is removed from the forming means.

3,814,374

RETRACTABLE CASTING CORE BOX WITH ELASTOMERIC JOINT SEAL

Paul K. Beemer, Laguna Beach, and George E. Huck, Fullerton, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed July 10, 1972, Ser. No. 270,465
Int. Cl. B28b *7/30*
U.S. Cl. 249—179 **16 Claims**



A retractable core for use with an outer form in producing concrete castings includes a rectangular wall-forming box hav-

ing a hollow interior and an opening at its bottom to allow access to its interior. The walls of the box are separated symmetrically into four quadrants, and the lines of separation between quadrants are sealed by a compressible elastomer. A retracting mechanism inside the box is connected to each quadrant. In use, concrete is poured over the box, and after the concrete cures, the retracting mechanism pulls each quadrant toward the center of the core to compress the elastomeric seal and thereby shrink the size of the core. The casting is then lifted over the core. Each quadrant is mounted on a separate set of elastically bendable support arms which deflect during retraction of the core and the subsequent return of the core to its initial wall-forming position.

3,814,375

SHUT-OFF VALVE AND CONTROL SYSTEM THEREFOR

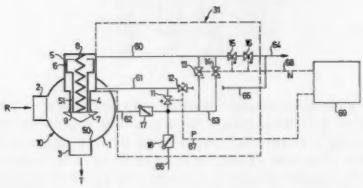
Karlheinz Grotloh, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Aug. 16, 1971, Ser. No. 172,092

Claims priority, application Switzerland, Sept. 1, 1970, 13021/70

Int. Cl. F16k *31/143*

U.S. Cl. 251—28 **6 Claims**



The valve is controlled over a servo-motor by the pressure of the working medium in the valve. The flow through the bleed line is passed either above or below the servo-piston to aid in the closing or opening of the valve. The control unit of the control system is mounted in the cover of the valve. Upon interruption of the signal lines, the valve closure member automatically moves into a safe position.

3,814,376

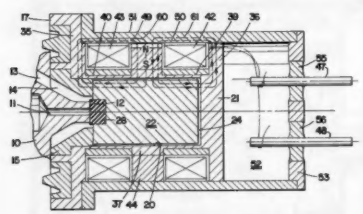
SOLENOID OPERATED VALVE WITH MAGNETIC LATCH

Robert H. Reinicke, Mission Viejo, Calif., assignor to Parker-Hannefin Corporation, Cleveland, Ohio

Filed Aug. 9, 1972, Ser. No. 279,048

Int. Cl. F16k *31/08;* **H01f** *7/08*

U.S. Cl. 251—65 **3 Claims**



A magnetically operated two position latching valve having an armature that also serves as a movable valve element and which is movable to its two positions by and latched in said positions solely by magnetic flux. The valve is moved to one position or the other by applying current to a solenoid means in one direction or the other and is latched in either selected position by a single permanent magnet whose flux is automatically switched to the proper direction for holding the armature in the selected position.

3,814,377

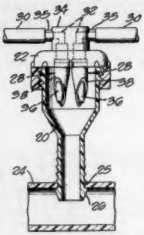
PRESSURE COMPENSATING TRICKLE VALVE

Theodore J. Todd, 1039 E. Grand Blvd., Corona, Calif. 91720

Filed Feb. 28, 1973, Ser. No. 336,413

Int. Cl. B05b *1/32;* **E02b** *13/02*

U.S. Cl. 251—145 **16 Claims**



The inner end of a tube for releasing pressurized fluid from an intermittent supply is tapered to form an inclined valve seat with a longitudinal groove in the valve seat and a flexible elastomer valve tongue closes against the valve seat to convert the groove into a restricted flow passage and the tongue varies in flexure with changes in pressure of the supply fluid to cover various extents of the open side of the groove so that the length of the restricted passage and the consequent resistance to release of the pressurized fluid vary to compensate for changes in the supply pressure of the fluid.

3,814,378

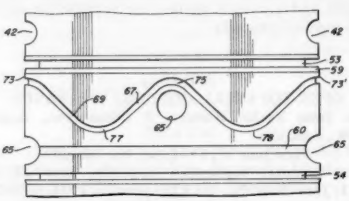
PRESSURE-BALANCED PLUG VALVE

Paul D. Wurzburger, 3255 E. Monmouth Rd., Cleveland Heights, Ohio 44118

Filed Dec. 4, 1972, Ser. No. 311,846

Int. Cl. F16k *39/00*

U.S. Cl. 251—283 **21 Claims**

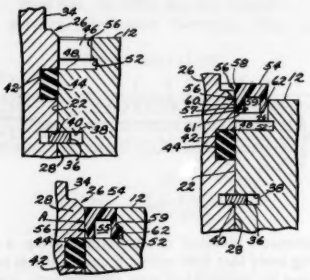


A rotary plug valve comprising a valve body having a cylindrical bore with axially offset lateral inlet and outlet ports communicating with the bore on opposite sides thereof. A cylindrical plug in the bore has a slanted passage which connects the inlet port to the outlet port in the open position of the valve. Sealing means are provided at each end of the plug. Flow sealing means is provided on the periphery of the plug between the end sealing means and follows a continuous sinuous path around the plug having peaks which extend alternately above and below the inlet port. The path lies between the inlet and outlet ports in the closed position of the valve to prevent leakage therebetween. Substantially identical increments of the path are diametrically spaced apart and encompass equal areas on opposite sides of the plug. The plug is thereby balanced under all operating conditions against forces created by the fluid pressure acting thereon.

3,814,379
ROTARY VALVE WITH ANTI-CORROSION AND TORQUE CONTROLLING MEANS

Frank C. Hackman, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed July 6, 1972, Ser. No. 269,294
Int. Cl. F16k *31/00*
U.S. Cl. 251—297 **8 Claims**

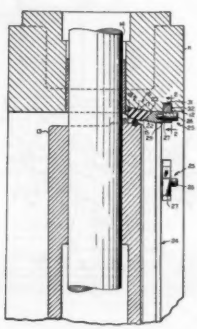


A rotary valve assembly of the "soft seat" type for use in fluid distribution systems such as gas or water. The valve assembly includes a valve housing having a fluid passage therethrough and a rotary valve structure including a valve operating member or stem extending exteriorly of the housing and a valve member for cooperating with valve seat means in the flow passage. Means are provided between the valve stem and the wall of the bore through which the valve stem extends for applying a controlled torque sufficient to render the valve structure inoperative by hand. Additionally, the torque controlling means prevents ingress of fluid or abrasive material to the interior of the valve assembly and also prevents corrosion between the valve stem and valve housing.

3,814,380
ADJUSTABLE BODY SEAT FOR BUTTERFLY VALVES

Kalman Kormos, North Scituate, and Dezso Szilagyi, Cranston, both of R.I., assignors to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 125,047, March 7, 1971, abandoned. This application Nov. 20, 1972, Ser. No. 308,218
Int. Cl. F16k *1/226*
U.S. Cl. 251—307 **14 Claims**

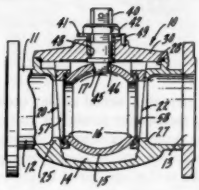


The disclosure concerns a butterfly valve having a resilient, adjustable body seat for the pivoting disc. The seat comprises an elastomeric ring which is confined at one end by the transverse wall of an annular groove in the valve body and at the other end by a clamping ring which slides along the wall of the flow passage extending through the body. The clamping ring is forced against the seat ring by a plurality of individual screw actuators spaced around its circumference, and therefore selected portions of the seat ring can be compressed as needed to produce a leak-free seal around the entire periphery of the pivoting disc.

3,814,381
COMBINATION STEEL AND TEFLON SEAT

John Yopp, Homewood, Ill., assignor to Union Tank Car Company, Chicago, Ill.

Continuation-in-part of Ser. No. 181,776, Sept. 20, 1971, abandoned. This application May 25, 1973, Ser. No. 364,181
Claims priority, application Canada, Aug. 1, 1972, 148452
Int. Cl. F16k *5/06, 5/20*
U.S. Cl. 251—315 **5 Claims**

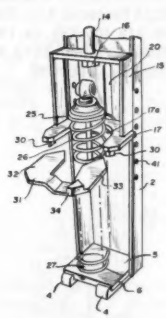


An improved seat ring, having a wedge shape cross section, for use within a top entry ball valve; including: an outer ring, formed of material substantially immune to circumferential and radial expansion, having a rear inclined surface positioned to contact cooperating ring retainer sidewalls; and an inner ring, formed of a yieldable material, secured to a front surface of the outer ring and positioned to form a seal with the ball.

3,814,382
SPRING COMPRESSOR

John H. Castoe, Sunland, Calif., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Jan. 19, 1972, Ser. No. 219,034
Int. Cl. B23p *19/04*
U.S. Cl. 254—10.5 **12 Claims**



An apparatus for compressing a spring in conjunction with a shock absorber or other similar structure wherein the apparatus includes a frame upon which a spring to be compressed is mounted. An upper yoke member is slidably mounted in the frame and is operatively connected to a power sourc whereby a bracket is in position to act with source yoke member to contact a spring being compressed. Downward

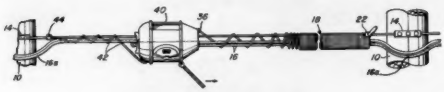
movement of the yoke causes compression of the spring in a manner that any desired service or operation can be performed on the spring assembly being compressed. The frame further includes a safety mechanism to insure that the spring is safely compressed during service.

3,814,383

METHOD OF STRINGING AERIAL CABLE

Richard L. Jackson, Lewisburg, Ohio, assignor to Jackson Communication Corporation, Clayton, Ohio

Filed Feb. 8, 1973, Ser. No. 330,500
Int. Cl. E21c *29/16*
U.S. Cl. 254—134.3 CL **6 Claims**



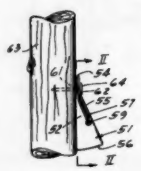
A method of stringing aerial cable, such as coaxial cable, from an existing messenger strand. A coil of resilient, temporary, supporting wire is positioned about an existing messenger strand adjacent one of the messenger strand supports and an end of the coil is anchored to the messenger. A cable puller is positioned on the messenger and an opposite end of the coil is attached to the cable puller. The cable to be installed is then threaded through the coil and attached to the puller. The puller is then moved along the messenger, uncoiling the temporary supporting wire and positioning the cable beneath the messenger. A lasher is then mounted on the messenger adjacent an end of the expanded coil and the coil attached to the messenger. The lasher is then propelled along the messenger, recoiling the temporary supporting wire and applying a permanent helical wrapping about the messenger and the cable to attach the cable to the messenger.

3,814,384

INSULATOR AND SUPPORT FOR ELECTRICALLY CHARGED FENCE WIRES

George F. Oltmanns, 2528 Pensacola Ave., Chicago, Ill. 60618

Division of Ser. No. 118,406, Feb. 24, 1971, Pat. No. 3,684,247. This application May 19, 1972, Ser. No. 255,038
Int. Cl. A01k *3/00*
U.S. Cl. 256—10 **3 Claims**



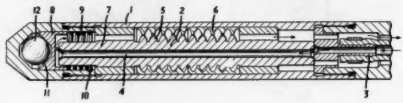
A reusable insulator and support for attaching electrically charged fence wire to fence posts or rods comprises a flexible, strip-form member composed of a dielectric material. The support member has a portion deflectable into a configuration for encircling the fence wire and is attachable to the fence post in a manner to support the fence wire on the post.

3,814,385

REGULATOR FOR PNEUMATIC VIBRATOR

Henrik Holmlund, Jarfalla, and Erik Kareby, Enskede, both of Sweden, assignors to Aktiebolaget Vibro-Verken, Solna, Sweden

Filed Jan. 11, 1973, Ser. No. 322,689
Claims priority, application Sweden, Jan. 13, 1972, 345/72
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 R **8 Claims**



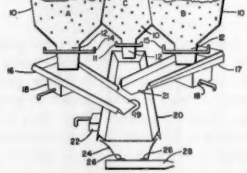
A pneumatic vibrator of the type having a vibration-generating body that rolls within a casing and is powered by compressed air is provided with an automatic control valve that limits the vibration of the vibrator to a predetermined value, regardless of the load imposed upon the vibrator. A valve member interposed in the passage by which compressed air is delivered to the vibration-generating body is normally urged into an open position that provides normal operation of the vibrator. A regulating body rolls in a raceway, one surface of which is movable in association with the valve member. When the regulating body is subjected to acceleration beyond a given value, it shifts outwardly, relative to the axis of the raceway, thereby shifting the movable surface of the raceway and, in turn, the valve, to reduce the air flow.

3,814,386

METHOD FOR VIBRATORY BLENDING OF FLUID PARTICULATE MATERIALS

Henry G. Guglietti, 71 Wallace Rd., Fitchburg, Mass., assignor to Plastic Materials Systems, Inc., Fitchburg, Mass.

Division of Ser. No. 775,265, Nov. 13, 1968, Pat. No. 3,638,922. This application Jan. 10, 1972, Ser. No. 216,860
Int. Cl. B01f *11/00*
U.S. Cl. 259—2 **3 Claims**



A method is provided for proportionating and mixing fluid-particulate materials such as thermoplastic particles, wherein streams of material are dispensed from a plurality of hoppers to a plurality of vibrating channels, the channels converging to a final vibrating channel which blends all the materials.

3,814,387

APPARATUS FOR DOSING AND MIXING LIQUID OR SOLID MATERIALS FOR DENTAL PURPOSES

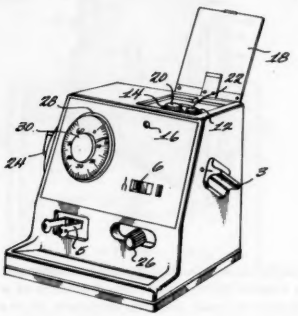
Wilhelm Ahrens, Bergen-Enkheim; Hans Lea, Frankfurt; Fritz Rohm, Stuttgart-Kaltental, and Heinz Straehle, Schwabisch Gmund, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurth am Main, Germany

Filed Nov. 30, 1972, Ser. No. 310,967

Claims priority, application Germany, Dec. 1, 1971, 2159454

Int. Cl. B01f *11/00*

U.S. Cl. 259—72 1 Claim



A space saving apparatus is provided for dentists wherein both the measuring and mixing of metal filings for preparing the amalgam paste and the shaking of premeasured capsule containing components for the preparation of dental cements and dental synthetic resins are carried out in a single housing.

3,814,388

DYEING PROCESS FOR SYNTHETIC MATERIALS

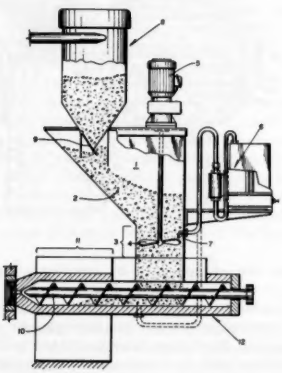
Peter Jakob, Offenbach, Germany, assignor to Colortronic Reinhard & Co. KG, Friedrichsdorf-Koppern, Germany

Filed Jan. 28, 1972, Ser. No. 221,678

Claims priority, application Germany, Feb. 16, 1971, 7105798[U]; Apr. 10, 1971, 2117588; Apr. 29, 1971, 2121033

Int. Cl. B29b *1/04, 3/00;* G05d *11/35*

U.S. Cl. 259—191 5 Claims



Method for adding liquid color to uncolored synthetics. The dyestuffs are metered by an electronically controlled metering pump and delivered to the synthetics just before or after the synthetic enters the plasticizer of a fabrication device.

3,814,389

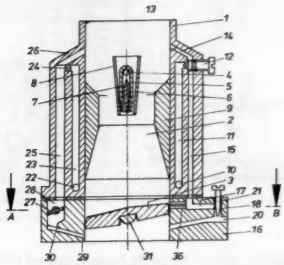
CARBURETOR

Paul August, Capellades 1, Barcelona 6, Spain

Filed May 2, 1972, Ser. No. 249,556

Int. Cl. F02m *1/04*

U.S. Cl. 261—39 D 18 Claims



A carburetor for an internal combustion engine has a plurality of passage means for providing fuel-air mixtures for the various operating ranges of the motor. Each of the passage means is formed to cause said fuel-air mixture to approach sonic velocity in its passage therethrough.

3,814,390

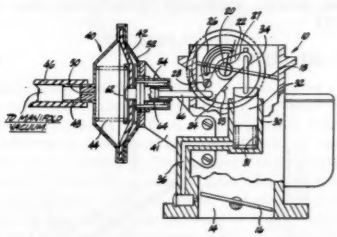
CARBURETOR WITH COMBINED PISTON MOTOR AND DIAPHRAGM MOTOR CHOKE VALVE ACTUATION

Jerry H. Winkley, St. Louis, Mo., assignor to ACF Industries Incorporated, New York, N.Y.

Filed July 5, 1972, Ser. No. 269,124

Int. Cl. F02m *1/10*

U.S. Cl. 261—39 B 6 Claims

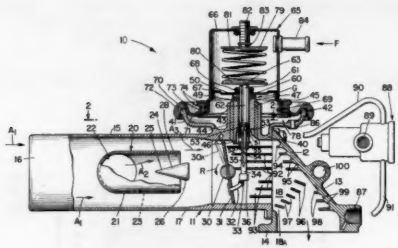


Reduction of exhaust emissions is obtained by controlling the carburetor choke valve with greater flexibility. A piston motor responsive to manifold vacuum opens the choke valve partially soon after the engine starts. A diaphragm motor responds to engine vacuum more slowly than the first motor. The diaphragm acts through a modulating spring to open the choke valve, which is connected to a thermostatic coil spring urging the choke valve closed at low ambient temperatures. At high ambient temperatures, actuation of the diaphragm causes wide opening of the choke valve, and at low ambient temperature causes less initial opening, followed by further opening of the choke valve as the engine warms up.

3,814,391
VEHICLE FUEL INJECTOR

Oscar R. Cedarholm, 3011 Cedar Ln., Eureka, Calif. 95501

Filed Jan. 10, 1972, Ser. No. 216,361
Int. Cl. F02m 29/04
U.S. Cl. 261—50 R 10 Claims



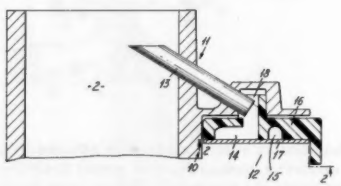
External air and a charge of augmented air from an air augmenter or booster are directed through passages defined by a series of spaced horizontally oriented guide plates. Fuel picked up by the uppermost stream of air is driven over a series of ribs where it is successively impinged and atomized at different levels by the incoming streams of air. The air fuel mixture, now substantially atomized, if forced through a series of downstream guide plates and further atomized with the aid of plural downstream ribs.

A special fuel injection mechanism in conjunction with the relay valve operates to quickly cut-off the supply of fuel when there is a temporary lack of demand for the fuel in order to minimize air pollution and smog.

3,814,392
CARBURETOR BOWL VENT

William D. Boyd, Orchard Lake, Mich.; Dennis L. E. Dale, Benfleet, and Roy Jones, Bishops Stortford, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 21, 1972, Ser. No. 291,112
Claims priority, application Great Britain, Apr. 4, 1972, 15272/72
Int. Cl. F02m 5/08
U.S. Cl. 261—72 R 6 Claims

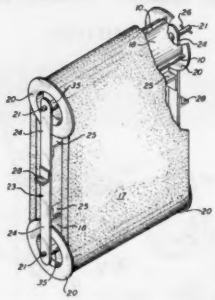


The float bowl of a carburetor has an insert mounted in the top portion to reduce fuel vapor emissions, the insert having a maze-like channel formed to lengthen considerably the distance the fuel vapor must travel prior to flow through an internal vent tube to the induction passage, to reduce normally excessive fuel delivery at low rpms resulting from engine pressure pulsation.

3,814,393
HUMIDIFIER

George L. Malmgren, P.O. Box 271, Pinebrook, N.J. 07058

Filed May 12, 1972, Ser. No. 252,913
Int. Cl. B01f 3/04
U.S. Cl. 261—80 1 Claim

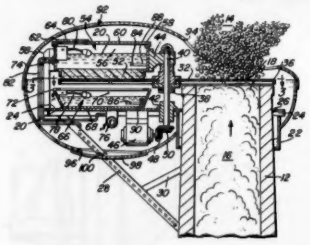


A humidifier in which air is passed both through and around a moving loop of spongy material, a portion of which passes through a pool of liquid; the loop intersects, at an opening, the column of moving air, which must pass through it.

3,814,394
APPARATUS FOR ENCAPSULATING HOT GASES FROM HIGH STACKS

Michael F. Murray, 189 Cedar Ave., Oroville, Calif. 95965

Filed Nov. 17, 1971, Ser. No. 199,789
Int. Cl. B01d 47/00
U.S. Cl. 261—83 14 Claims



Hot gases are encapsulated by creating a high draft by passing them up a high stack, subjecting hot gas leaving the stack to a bubble-forming medium, and entrapping the hot gas in bubbles formed by the hot gas impinging on the bubble-forming medium. The hot gas is subjected to a bubble-forming medium, such as latex, by a continuously rotated screen wheel having a screen defining a mesh for carrying the bubble-forming medium. A sponge impregnated with the bubble-forming medium and in direct contact with the screen wipes the screen for continuously applying the bubble-forming medium thereto.

3,814,395
AERATION PLANT FOR CLARIFYING SEWAGE AND WASTE EFFLUENTS

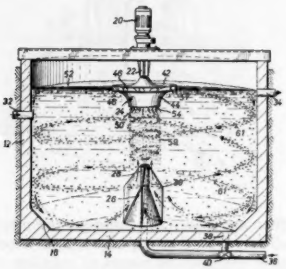
Joseph Richard Kaelin, Villa Seeburg, Buochs, Switzerland

Continuation-in-part of Ser. No. 806,767, Jan. 31, 1968, abandoned, which is a continuation of Ser. No. 434,838, Feb. 24, 1965, abandoned, and a continuation-in-part of Ser. No. 64,125, July 30, 1970, abandoned, which is a continuation of Ser. No. 593,562, Nov. 10, 1966, abandoned. This application Apr. 17, 1972, Ser. No. 244,783

Claims priority, application Switzerland, Feb. 27, 1964, 2445/64; May 14, 1964, 6340/64; Nov. 11, 1965, 15542/65

Int. Cl. B01f *3/04*

U.S. Cl. 261—87 **12 Claims**



An apparatus for surface aeration and circulation of liquids, comprising a tank for containing a body of liquid. An aeration rotor is positioned at least partially submerged in the body of liquid in the tank. This rotor rotates about a substantially vertical axis and includes a shaft position on the vertical axis of the rotor. A first wall member is secured centrally to and extends radially outwardly from the shaft and a second wall member extends radially outwardly from the shaft and has a centrally arranged opening therein concentrically disposed about the shaft of the rotor. Partition means secured to and extending between the first and second wall members form a plurality of guide channels defining flow passageways therebetween, with the opening in the second wall member providing a first opening to each of the flow passageways. A second opening is located at the opposite end of each of said flow passageways at the outer edges of the wall members. There is also provided means for feeding air into each flow passageway substantially at a location where the liquid disposed thereat is moving substantially laterally towards the outer edges of said wall members, the opening of the rotor being freely accessible to the liquid circulating in said tank. The second wall member is formed by a surface of revolution about the vertical axis of the rotor whose generatrix forms a continuous curve extending from the periphery of the first opening to the periphery of the second opening, said curve initially converging inwardly towards the axis of the rotor for a minor portion of its length and then diverging outwardly away from the axis of the rotor for a major portion of its length and the outer end of the curve terminating in a substantially horizontal position at the periphery of said second opening and being in close proximity to the level of the liquid in the tank.

3,814,396
AERATION APPARATUS

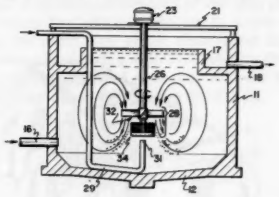
David Di Gregorio, Salt Lake City, and Gerald Lynwood Shell, Sandy, both of Utah, assignors to Envirotech Corporation, Salt Lake City, Utah

Filed Feb. 16, 1972, Ser. No. 226,855

Int. Cl. B01f *3/04*

U.S. Cl. 261—93 **4 Claims**

A submerged aerator includes a non-impelling bubble shearing mechanism rotating with and below an axial flow impeller which impells liquid downward past the bubble shearing mechanism to entrain the sheared bubbles in the downward flow to provide increased retention of the sheared bubbles in the lower portion of the liquid body. The shearing mechanism



includes a hollow cylinder having an open bottom to receive bubbles, a closed top concentrically secured to a rotating shaft, and a slotted sidewall through which the bubbles are released and sheared.

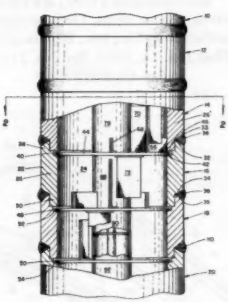
3,814,397
CONTACTING COLUMN

Jacob M. Geist, Allentown; Roy A. Paul, Bethlehem, both of Pa., and Robert M. Thorogood, West Horsley, England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 829,469, June 2, 1969, Pat. No. 3,590,475, which is a continuation of Ser. No. 585,796, Oct. 11, 1966, abandoned. This application Dec. 21, 1970, Ser. No. 100,529

Int. Cl. B01d *3/16*

U.S. Cl. 261—114 R **2 Claims**



Disclosed is a small diameter contact column having a vertical series of contact chambers separated by perforate plates. Fully erected columns of this type are substantially inaccessible for subsequent placement and attachment of internal parts. The column is achieved by superimposing a plurality of interengaging cylindrical sections adapted along their outermost engaging edges to be rigidly joined and along their innermost engaging edges to receive and support a perforate plate. The perforate plate support means permits free relative movement of the plate due to temperature change and at the same time prevents liquid from passing between the column wall and the peripheral edge of the perforate plate.

3,814,398
DIRECT CONTACT STEAM CONDENSER

William J. Bow, Morristown, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

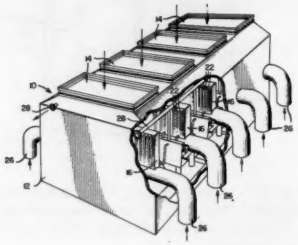
Filed Sept. 27, 1972, Ser. No. 292,581

Int. Cl. F28b *3/00*

U.S. Cl. 261—115 **4 Claims**

A direct contact steam condenser in which a housing is provided having at least one inlet in the top portion thereof for

receiving steam which is directed downwardly through a plurality of chambers defined by a plurality of partitions in the housing. Each partition is formed by a pair of spaced vertical walls having a plurality of openings extending therethrough arranged in a plurality of spaced vertical rows. Cooling water is introduced into the spaces between each pair of vertical walls



thereby it is discharged through the openings into the chambers. A plurality of vertically extending deflector plates are supported by the walls adjacent the rows of openings with each deflector plate extending at an angle to its respective wall and over a portion of the openings in its respective row for deflecting the water in a manner to form a continuous film of water.

3,814,399

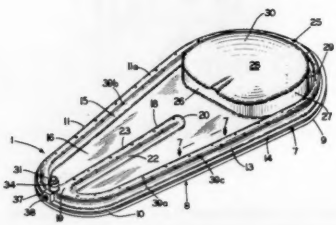
WATER AERATING DEVICE

Robert V. Melreit, Gates Mills, Ohio, assignor to Royal Appliance Manufacturing Co., Inc., Highland Heights, Ohio

Filed Jan. 14, 1972, Ser. No. 217,849

Int. Cl. C02b 9/00

U.S. Cl. 261—124 **3 Claims**



A device for aerating water in a bathtub by a flow of heated air supplied to the device from a remote source. The device comprises a generally oval flat bottom base with a top section permanently attached thereto. The top section is formed with an inverted outer U-shaped channel extending around the periphery of the top section and forming an air passage with the base. Another similarly shaped central channel extends from one end of the top section longitudinally along the top section forming another air passage. The channels are supplied with the heated air under pressure through a connected hose, and the air then flows into the water through a plurality of spaced holes formed in the channels. An opening is formed in the outer channel to provide access into both outer and central channels for cleaning. A slip collar is mounted on the supply air hose coupling to permit regulation of the amount of water aeration. A seat is formed integrally on the top section to provide a comfortable area upon which the bather may sit when using the device.

3,814,400

IMPELLER REPLACING DEVICE FOR MOLTEN METAL STIRRING EQUIPMENT

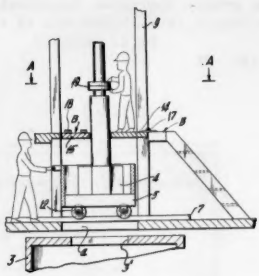
Masahiko Seki, Kitakyushu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 20, 1972, Ser. No. 317,002

Claims priority, application Japan, Dec. 22, 1971, 46-121408

Int. Cl. C21c 7/00

U.S. Cl. 266—1 R **2 Claims**



In a molten metal stirring equipment comprising a hood, a rotary shaft extending through the hood, an impeller attached to the end of the shaft by means of coupling and a molten metal vessel which is taken in and out below the hood, the impeller replacement device comprises a work floor provided on the hood, openings provided through the hood and the floor through which the impeller passes, a truck movable on the floor to the openings, and a work deck arranged above the opening of the floor.

3,814,401

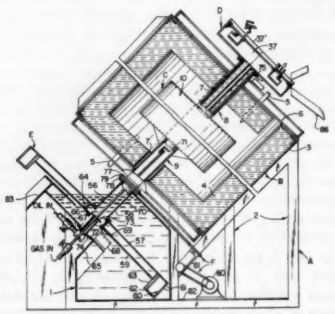
TILTED ROTARY RETORT INDUSTRIAL FURNACE

Alvin W. Davis, c/o Al Davis Co., 2925 Harding Hwy., Apt. 7, Lima, Ohio 45804

Filed Sept. 1, 1972, Ser. No. 285,678

Int. Cl. C21d 1/66

U.S. Cl. 266—4 A **12 Claims**



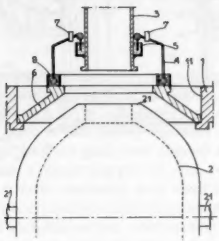
A tilted rotary retort industrial furnace for processing metal workpieces in a controlled atmosphere which includes a heated gas-tight chamber rotatably mounted at an incline of 45° (±5°) to the horizontal to turn continuously in one direction with the interior of the chamber being partitioned into successive intercommunicating zones, there being means provided for feeding workpieces into the chamber and for facilitating step-by-step gravitational advance of such workpieces through the zones to a discharge tube means having substantially less transverse dimension than the chamber and

permanently aligned with and rotating with the chamber and disposed within and beneath the surface of a liquid quenching medium to effect a liquid seal.

3,814,402
DEVICE FOR COLLECTING GASES FROM A CONVERTER

Andre Maubon, Saint-Etienne, France, assignor to Creusot-Loire Entreprises, Paris, France

Filed July 9, 1973, Ser. No. 377,229
Claims priority, application France, Aug. 3, 1972, 72.28007
Int. Cl. C21c *5/40*
U.S. Cl. 266—16 **5 Claims**

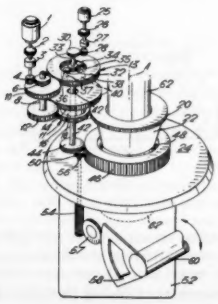


A device for collecting gases from the spout of a converter for use in a dust-collecting installation comprises a hood for connection to the dust-collecting installation, a skirt connected in fluid-tight manner to the hood and mounted to be stationary in use of the converter, a canopy surrounding with clearance the converter spout, connected to the skirt in fluid-tight manner, supported in a cut-away in a platform at the level of the converter spout and provided with a cut-away with a vertical plane normal to that including the converter trunnions, a shutter for closing the cut-away in the canopy, movable vertically relative thereto and connected to the skirt in fluid-tight manner, and pressure control means for maintaining the pressure within the skirt substantially equal to that externally of the skirt.

3,814,403
DRIVE FOR FURNACE CHARGE DISTRIBUTION APPARATUS

Edouard Legille, Luxembourg, Luxembourg, assignor to S.A. Des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Apr. 30, 1973, Ser. No. 355,730
Claims priority, application Luxembourg, May 8, 1972, 65312
Int. Cl. F27b *1/20*
U.S. Cl. 266—27 **11 Claims**

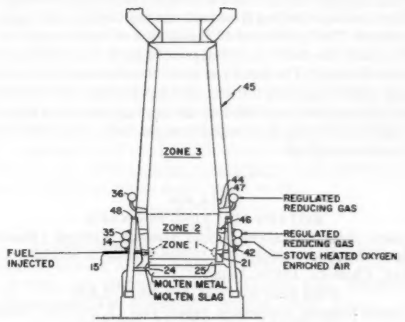


A drive and mounting mechanism for a rotatable and angularly adjustable charge distribution device mounted in the throat of a blast furnace is disclosed. The drive mechanism includes a rotary disc mounted concentrically with the tubular feed spout through which charge material is delivered to the distribution device, the distribution device being suspended from the underside of the rotary disc, and a ring gear rotatably supported on the upper side of the disc and movable independently thereof. A drive shaft coupled to the ring gear passes through the rotary disc and is connected to means for selectively varying the inclination of the distribution device. The drive mechanism also includes means for rotating the disc and gear and for varying the speed ratio therebetween to thereby drive the inclination adjustment means drive shaft.

3,814,404
BLAST FURNACE AND METHOD OF OPERATING THE SAME

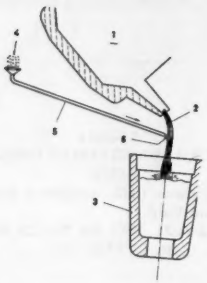
Harry B. Claflin, Upland, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Filed Jan. 31, 1972, Ser. No. 221,900
Int. Cl. F27b *1/00*
U.S. Cl. 266—29 **15 Claims**



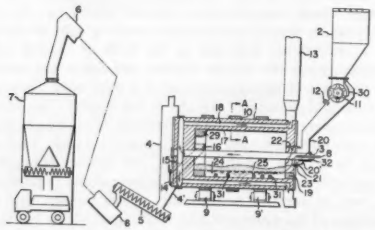
A blast furnace of improved and more readily controllable operation which comprises three sets of tuyeres, i.e., the normal or primary tuyeres at the base or melting zone of the furnace, a second set disposed in the bosh or second zone, preferably above the middle thereof and below the mantel, and a third set of tuyeres disposed in a third zone above the bosh zone and preferably just above the mantel. The second and third tuyere sets are used to introduce reducing gas which mixes with that generated in the furnace to create, limit and control the second and third zones. The furnace atmosphere and operation are controlled and temperatures regulated in each zone to improve permeability of the burden, rate and completion of the reduction and smelting of ore to hot metal and improved utilization of the burden coke by controlled introduction of increments of reducing gases into each of the second and third sets of tuyeres and thence to the furnace zones so formed. Means of re-forming off-take stack gases and of generating reducing gas from a low cost source to provide reducing gases for such introduction are associated with the blast furnace in an advantageous embodiment. A method of operation in reducing ores, for example iron ores, and a system for such operation with production of suitable reducing gases are also provided.

3,814,405
STEEL MAKING APPARATUS
Jose Joaquin Aguirre Ormaechea, Independencia 1,, Vitoria, Spain
Division of Ser. No. 79,529, Oct. 9, 1970, Pat. No. 3,756,805.
This application Nov. 8, 1971, Ser. No. 196,607
Claims priority, application Spain, Feb. 3, 1970, 376,188
Int. Cl. C21c 7/00
U.S. Cl. 266—34 T 3 Claims



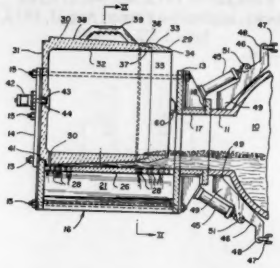
An apparatus for making lead-bearing steel which comprises a melting furnace, and a ladle for receiving a stream of molten steel discharging from said melting furnace and spaced therefrom. The lead is fed to the stream of molten steel at a point where the latter is being poured from the melting furnace to the ladle. The latter has an interior bottom surface and a ladle outlet adjacent thereto. The ladle outlet prevents substantially any lead deposited on the interior bottom surface of the ladle from being discharged from the ladle, when the latter is poured or tapped.

3,814,406
ROTARY MELTING FURNACE
Katsumi Shimizu, Takehara, and Mamoru Kimura, Ohmuta, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Chuo-ku, Tokyo, Japan
Filed June 20, 1973, Ser. No. 371,831
Claims priority, application Japan, July 27, 1972, 47-74605
Int. Cl. C22b 19/30
U.S. Cl. 266—36 H 7 Claims



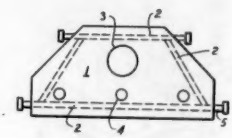
A rotary melting furnace for separating and recovering metallic zinc from metallic zinc bearing material, which comprises a cylindrical furnace body, a combustion cylinder for heating said furnace body, a burner, a sealing case, a chute for charging the raw material into said sealing case and a pipe for discharging final residue.

3,814,407
SLAG SKIMMING APPARATUS
Leo J. Meyers, Pittsburgh, Pa., assignor to Louis A. Grant, Inc., Pittsburgh, Pa.
Filed May 18, 1973, Ser. No. 361,764
Int. Cl. F27d 3/14
U.S. Cl. 266—37 20 Claims



Apparatus for skimming slag from molten iron poured from a submarine ladle or the like is comprehended in a frame attachable to a submarine ladle in communication with the port thereof. The frame holds a diversion trough, into an end of which the iron is poured when the ladle is tilted, the diversion trough having perforations in its bottom, a collecting trough positioned below the diversion trough so as to receive the iron therefrom and direct it to a transfer ladle, and an open-end slag collecting basket positioned in the diversion trough having a skimmer lip at its open end. The perforations in the diversion trough retard the flow of iron sufficiently to maintain a dynamic pool of iron therein, which buoys the open end of the slag collecting basket so as to maintain its skimmer lip at a skimming level.

3,814,408
COVER FOR CASTING VESSELS IN CONTINUOUS CASTING MACHINES
Franco Cominotti, Odolo, Italy, assignor to Concast AG, Zurich, Switzerland
Filed Dec. 16, 1971, Ser. No. 208,717
Claims priority, application Sweden, Dec. 18, 1970, 18782/70
Int. Cl. F27d 1/10
U.S. Cl. 266—39 3 Claims



A cover for casting vessels such as tundishes used in connection with continuous casting machines comprises a body formed of a base metal such as cast iron which is provided with reinforcing members extending therethrough formed of a metal such as steel having a higher tensile strength than said base metal whereby the resistance of said cover to warping is improved.

3,814,409
PREPOSITIONED AND GAP ALIGNED SPLIT PISTON RING ASSEMBLIES

Herbert F. Prasse, Town and Country, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

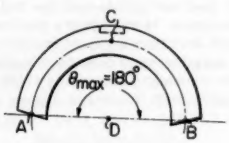
Filed May 10, 1971, Ser. No. 141,612
Int. Cl. F16f 1/34
U.S. Cl. 267—1.5 3 Claims

A split piston ring assembly incorporates a combined end alignment and gap spacing device for use with an expander-spacer split piston ring of the assembly for prepositioning the ends of the ring prior to and during assembly of the ring on a piston and for guiding the ends into aligned abutment when the ring is seated in a piston ring groove. The device includes a member having a cross sectional area sized to be telescopically received in a circumferential channel in the expander-spacer ring and includes means cooperating with wall segments forming the channel to retain the ends in a spaced-apart relationship against inherent resilient forces tending to move the ring ends together and to permit relative telescopic movement between the member and the ring when a greater force is applied to close the gap and seat the ring in the piston ring groove.

3,814,410
LEAF SPRING CONSTRUCTION

Hiroshi Fukui, Gifu-ken; Gakuji Iwatsu, Tokai, and Junichi Kato, Nagoya, all of Japan, assignors to Aichi Steel Works, Limited, Aichi-ken, Japan

Continuation-in-part of Ser. No. 104,018, Jan. 5, 1971, Pat. No. 3,705,718. This application Sept. 26, 1972, Ser. No. 292,298
Claims priority, application Japan, Dec. 20, 1971, 46-103416
Int. Cl. F16f 1/22
U.S. Cl. 267—47 4 Claims

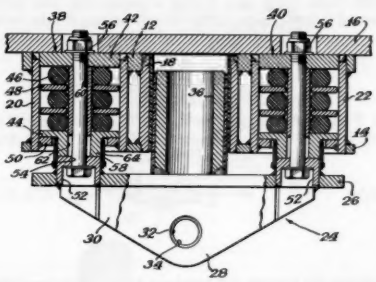


An improved leaf spring construction adapted to be suspended at opposite ends thereof and loaded at its mid-portion characterized in that said construction comprises at least one leaf element made from a flat sheet of uniform width and thickness with the intermediate portion of the spring including said mid-portion and extending over 50 percent of the length of said spring. The spring construction further having an arculate cross-section with its convex side directed upwardly, the curvature of the arc diminishing toward and into flat end portions of the spring. The form of the cross-section of the leaf of said spring construction being additionally characterized in that the angle of the sector of a circle at the intermediate portion and which intersects the thicknesswise bisector line of the arc at the edges of the leaf and the widthwise bisector point of the line covering the line between the edges of the leaf spring is not more than 210°.

3,814,411
CUSHION HITCH

Geoffrey L. Aarons, Lake Forest, and Ralph M. De Weese, Antioch, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 10, 1972, Ser. No. 251,867
Int. Cl. F16k 1/40
U.S. Cl. 267—63 R 5 Claims

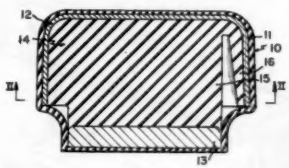


A cushion hitch for a vehicle capable of cushioning both push and pull loads having a housing affixed to the vehicle with a central guide tube and a pair of chamber tubes on either side thereof. A spring assembly is positioned in each of the chamber tubes and includes front and rear plates separated by a plurality of elastomer toroids with interleaved metal washers with stops to prevent the plates from exiting from the respective tubes. A hitch adapter is provided with means for pushing the front plates toward the rear plates under push loads imposed on the adapter and means for pulling the rear plates toward the front plates under pull loads. Various spring rates and maximum operating loads can be varied by varying the size and number of toroids with spacer rings being utilized to maintain the smaller toroids with larger central openings centered and aligned within the chamber tubes.

3,814,412
ELASTOMERIC VIBRATION ISOLATION PAD

James E. Britton, Akron; John A. Welch, Cuyahoga Falls, both of Ohio, and Richard D. Hein, Wabash, Ind., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Sept. 11, 1972, Ser. No. 288,242
Int. Cl. F16f 3/08
U.S. Cl. 267—152 6 Claims



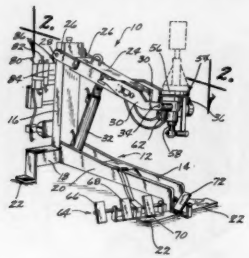
An elastomeric vibration isolation pad is provided having a relatively low vertical stiffness to lateral stiffness ratio generally less than about eight (8). An elastomeric member is secured between a base plate and a substantially rigid cup-like member and has a main body portion and a lateral stiffening portion. The lateral stiffening portion has an annular cup-like segment spaced apart from the main body portion and is secured to the inner surface of the cup-like member. Preferably, a plurality of ribs extend from the annular cup-like segment to the main body portion; or the annular cup-like segment has an inner surface portion contouring generally in shape to the compressively-deflected shape of the main body portion.

3,814,413

DEVICE FOR HOLDING AND MOVING A WORK OBJECT

Cecil W. Bopp, 2324 Ansborough Ave., Waterloo, Iowa 50701

Filed Sept. 8, 1971, Ser. No. 178,634
Int. Cl. B23q 3/18; F16k 31/46
U.S. Cl. 269—58 3 Claims



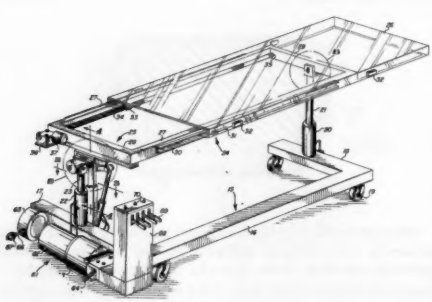
A device for holding and moving a work object comprising a support, an elongated elevation member hinged to the support, a work supporting head mounted on the distal end of the elevation member and adapted to rotate about a horizontal axis and a second axis perpendicular to the horizontal axis. Power means are provided for moving the elevation member upwardly and downwardly and for rotating the head about its first and second axes. Special controls are provided for controlling the elevation of the head, the tilt angle of the head, and the speed at which the head is rotating the work object. Check valves are provided in the hydraulic system for preventing the sinking of the head in response to gravitational force, for preventing the tilting of the head in response to outside forces, and for preventing the coasting of the head about its rotational axis when the means for rotating the head is deactuated.

3,814,414

MEDICAL EXAMINATION TABLE

Hector Chapa, 2048 Hicks St., San Antonio, Tex. 78210

Continuation-in-part of Ser. No. 274,635, July 24, 1972, abandoned. This application Nov. 8, 1973, Ser. No. 414,088
Int. Cl. A61g 13/00
U.S. Cl. 269—323 10 Claims



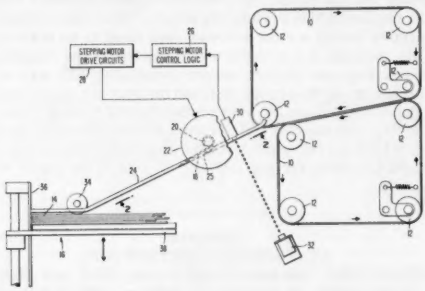
A medical examination table intended primarily for X-ray examinations, and comprising a movable base and a table proper movable vertically relative thereto. The table proper comprises a main frame, and an extensible section. The main frame is supported at each end from the base by an hydraulically actuated piston and is tiltable on a longitudinal axis under the influence of an hydraulically actuated piston. A screw stem provides adjustment for the extensible section relative to the main frame and is actuated by an electric motor. An hydraulic system is provided for the hydraulic cylinders and included therein is a power cylinder in which hydraulic pressure is generated by an electric motor. An electric system is also provided which includes the motors aforesaid. A control console includes operating levers for determining the flow of the hydraulic medium to the hydraulic cylinders and switching members for the electric circuit.

3,814,415

DEVICE FOR AIDING THE STACKING OF DOCUMENTS

James R. Hunter, Chadds Ford; S. James Lazzarotti, Broomall, and Edward A. Kelly, Jr., Springfield, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 27, 1972, Ser. No. 275,721
Int. Cl. B65h 29/14
U.S. Cl. 271—181 6 Claims



The present disclosure describes a technique for prevening collisions and jams of closely spaced documents, such as mail pieces which vary in size and weight, as they enter a stacking mechanism at high speed in a single file. Means are provided which are timed to impart a rotary motion about a vertical pivot point to each document as it approaches the stationary stack. Such motion insures that the leading edge of a succeeding document does not collide with the trailing edge of the preceeding document. Moreover, in a positive sense the leading edge of each document is caused to contact the previously stacked stationary document close to its leading edge, thereby eliminating the jamming of documents which might otherwise occur, particularly with documents having substantially different lengths.

3,814,416

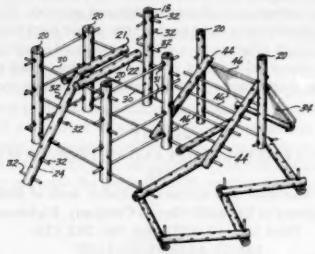
PLAYGROUND CLIMBING STRUCTURES

Warren B. Munger, Vashon Island, and Charles A. Kirby, Gig Harbor, both of Wash., assignors to Northwest Design Products, Inc., Tacoma, Wash.

Filed May 25, 1971, Ser. No. 146,734
Int. Cl. A63b 17/04, 3/00
U.S. Cl. 272—56.5 R 11 Claims

Playground equipment and climbing structures are described which may be disassembled and re-assembled into other forms by simple manipulation of parts. The structures are made up of the three basic elements, a large beam member having a plurality of throughbores along its length, a rod member adapted to be inserted within the throughbores of the beam member and, a pair of retaining collars, one positioned on each side of the beam member, to securely fasten the rod member within the through-bores of the beam member to prevent relative motion therebetween. The apparatus is constructed using one or more of the beam members in conjunc-

tion with one or more of the rod members having the required number of collars to hold the apparatus together. Individual play events, swings, climbing towers, ladders, parallel bars,

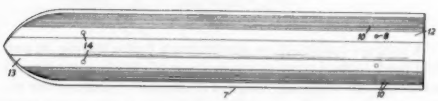


inclined ramps, scaffolding and a myriad of other configurations, either individually or as interconnected events, may be constructed according to the teaching of this invention.

3,814,417
SKI AND SKI PRACTICE MACHINE

William Paul Catlin, Knaresborough, England, assignor to Mogul Leisure Products Limited, Knaresborough, Yorkshire, England

Filed Aug. 7, 1972, Ser. No. 278,589
Claims priority, application Great Britain, Aug. 20, 1971, 3122/72; Aug. 22, 1972, 18844/71
Int. Cl. A63g 21/00
U.S. Cl. 272—56.5 SS **10 Claims**

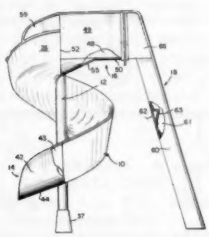


A ski is provided on its under surface with a longitudinal central part having a smoother surface configuration than the adjacent surfaces and this ski is to be used on a substantially hard smooth surface especially on an inclined belt which can be adjusted as to speed and inclination.

3,814,418
HELICAL SLIDE

Steven A. Henning, Anderson, Ind., assignor to American Playground Device Co., Anderson, Ind.

Division of Ser. No. 224,108, Feb. 7, 1972. This application Apr. 27, 1973, Ser. No. 355,197
Int. Cl. A63g 21/00
U.S. Cl. 272—56.5 R **2 Claims**

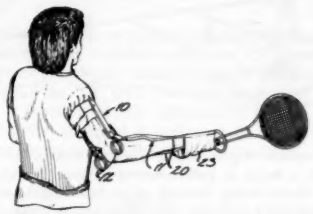


A slide and method of making it in which there is an upright ground-engageable post having a helical channeled bedway extending axially therealong with a ladder interconnected to the upper end of said bedway. The bedway is formed from an annular body having inner and outer radially spaced circumferential edges. After the body is formed, it is cut thereacross, a post is inserted through said body, and the inner circumferential inner edge of said body adjacent one of its ends is connected to said post. The opposite end of said body is pulled axially along the post to cause said body to project radially outwardly therefrom with its inner circumferential edge abutting said post along a helical path. Said inner circumferential edge is fastened to the post, and the ladder is then interconnected to the upper end of the extended bedway.

3,814,419
ARM EXERCISING DEVICE

Leon V. Bjorklund, 12106 E. Main Ave., and Richard T. Hubbard, 6809 E. Third Ave., both of Spokane, Wash. 99206

Filed June 4, 1973, Ser. No. 366,362
Int. Cl. A63b 23/00
U.S. Cl. 272—80 **5 Claims**

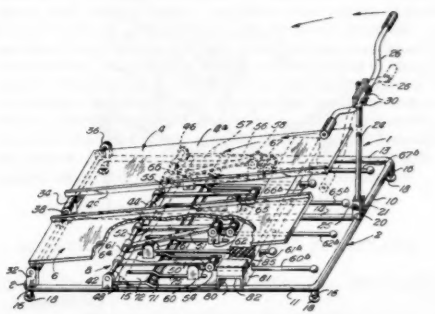


A device for exercising the extensor muscles of the arm comprises two elongated rigid arm members connected together by a pair of coil springs for pivotal movement about a transverse axis. The arm members include straps for mounting the device to a user's arm with one arm member alongside the user's upper arm and the other arm member alongside the user's forearm. The pivot axis of the arm members is located so as to extend transversely through his elbow. The coil springs provide a preset resistance to the muscle action required to straighten the arms as the user moves his arm to and from an extended position.

3,814,420
EXERCISE DEVICE

Jesse I. Encke, Rt. 2, Eastland, Tex. 76448

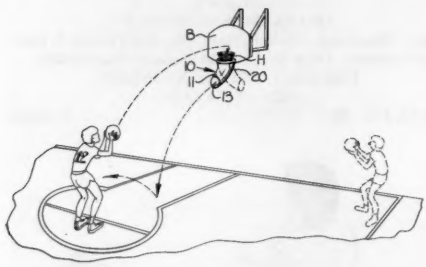
Filed Apr. 9, 1973, Ser. No. 348,945
Int. Cl. A63b 23/04
U.S. Cl. 272—83 R **6 Claims**



An exercise device comprising spaced pedals pivotally secured to a support shaft and resiliently urged upwardly by

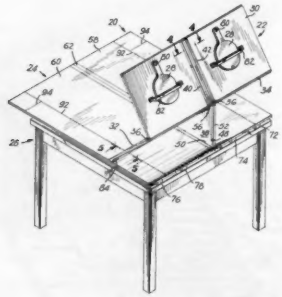
spring elements. One or more of a plurality of spring elements can be moved into engagement with the pedals to control the resultant spring constant and consequently the force resisting movement of the pedals.

3,814,421
BASKETBALL RETURN DEVICE
William Spier, Jr., 1747 Maryland Ave., Charlotte, N.C. 28209
Filed Dec. 7, 1972, Ser. No. 313,142
Int. Cl. A63b *63/04*
U.S. Cl. 273—1.5 A **5 Claims**



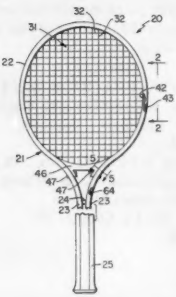
In a basketball goal assembly, a ball return chute positioned beneath a hoop in ball-receiving relation thereto, the ball return chute being formed of a lightweight, substantially shape-retentive material. The chute has an upper ball-receiving opening, a lower ball discharge opening, and a curved body portion, the body portion being of a length such that the ball discharge opening is at a height substantially above the playing surface above which the basketball goal assembly is positioned, whereby the ball may be returned on a bounce to the player. The chute is held in position beneath the hoop by nesting in a circumferentially notched ring. The chute has a tooth mating with the one of the notches at a time, and the angular position of the chute is adjustable by fitting the tooth into different notches. The ring may be attached to the backboard or suspended by hooks from the hoop.

3,814,422
REBOUND BOARD FOR TABLE HANDBALL
Barney B. Girden, 32 W. 46th St., New York, N.Y. 10023
Filed Aug. 4, 1972, Ser. No. 277,895
Int. Cl. A63b *69/00*
U.S. Cl. 273—30 **2 Claims**



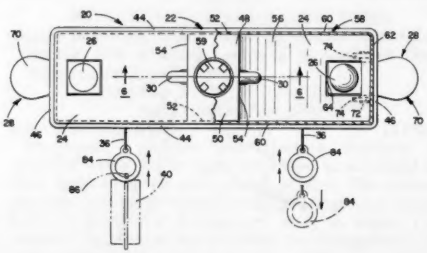
Game apparatus for enabling the play of a hand or paddle ball like game either solo or in competitive play and incorporating a backboard for returning a lightweight ball such as a table tennis ball impinged thereon and adapted for free-standing association on a table defining a generally horizontal playing surface and enables the floor to be used as a continuation of the table playing surface. The backboard, while being adapted to be placed on a table tennis table has an upper backboard portion and a lower backboard portion. The lower backboard portion serves to support the upper backboard portion at an angle relative to a table tennis table surface. The upper and lower backboard portions are connected by a T-shaped groove and tongue configuration connection member.

3,814,423
RACQUET CONSTRUCTION AND METHOD OF MAKING SAME
Gilbert R. Shockley, and Richard F. Hafer, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed June 12, 1972, Ser. No. 262,126
Int. Cl. A63b *49/10, 51/00*
U.S. Cl. 273—73 C **5 Claims**



A racquet construction comprising a frame having an ovaloid head portion terminating in a pair of closely spaced parallel extensions which are adapted to receive a handle at the terminal ends thereof with the head portion of the frame being defined by a pair of spaced metal portions. A beam made of a resilient elastomeric material is formed between the metal portions and holds such portions in substantially parallel relation and provides the sole support for adjoining stringing extending thereacross.

3,814,424
INCREMENTAL RACING GAME
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 19356, and Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 19316
Filed Feb. 21, 1973, Ser. No. 334,224
Int. Cl. A63f *9/14*
U.S. Cl. 273—86 G **2 Claims**



Toy apparatus for playing a competitive racing game where each player has a racing piece such as a toy car, and the

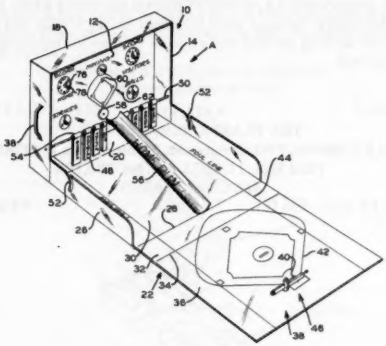
players each shoot at a target and thereby cause their racing piece to advance toward a finished line. In the illustrated apparatus, each racing piece is connected by a cord to a separate motor. Both motors are contained within a common housing. Operation of a motor acts to draw in its cord, to thereby advance its racing piece toward the finish line. Each motor is provided with a separate control means which includes a target such as a movable element. Each time the target element is moved, the motor advances its racing piece a predetermined increment of distance. Each player may have a missile such as ball, and a separate shooting or flipping means to propel his ball against his target element. Each player tries to hit his target element in as quick a succession as he can to cause his racing piece to reach the finish line before that of his opponent.

3,814,425

BALL GAME DEVICE

Bryan H. Kanefield, 9668 Huron Dr., Olivette, Mo. 63132, and Ronald Ritter, St. Louis, Mo., assignors to said Kanefield, by said Ritter

Filed July 26, 1972, Ser. No. 275,183
Int. Cl. A63f *7/06*
U.S. Cl. 273—89 **13 Claims**



A game device having a flat player board and a back wall at one end thereof for playing games employing playing balls, such as baseball on a miniatruized basis. A game playing field such as baseball field is imprinted on the player board. A suspension rod extends across said player board forwardly of said back wall and a plurality of score depicting plates swingably depend therefrom across the player board for determining the score of a player when contacted by the playing ball. A swingable ball engaging member is pivotally mounted at the end of the player board opposite the back wall and can be manually operated by a player to propel a playing ball toward the score depicting plates. A chute inclines downwardly toward the ball engaging member so that a ball rolled down the chute toward the ball engaging member can be engaged thereby and propelled to the score depicting plates. The device may be constructed so that it can be folded up in the form similar to a suitcase for portability.

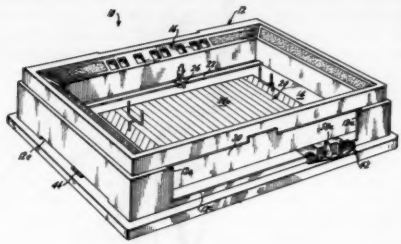
3,814,426

FOOTBALL GAME

Walter Moe, Huntington, L.I., N.Y., assignor to Aurora Products Corp., West Hemstead, N.Y.

Filed Mar. 19, 1973, Ser. No. 342,842
Int. Cl. A63f *9/00*
U.S. Cl. 273—94 R **11 Claims**

A competitive game of skill and chance which simulates the well-known game of football. The game board simulates a miniature football stadium having a football playing field which includes an XY grid having various indicia assigned to each set of X and Y coordinates or square of the grid. On each play of the game an indicator is movable by the players below the XY grid to illuminate a particular grid square and its corresponding indicia to show the results of the play. A selection device is provided and operated by the players to



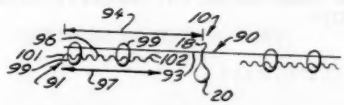
move the indicator, with one player independently controlling the X position of the indicator under the XY grid and the other player independently controlling the Y position of the indicator under the XY grid. The final position of the indicator is a function of the independent actions of the players, and the indicator is activated to illuminate the selected grid square to show the results of the "play."

3,814,427

PROJECTILE TETHERED TO LINKED RESILIENT FLEXIBLE LINE

Gustav Oskar Pahr, 97 Deep Dene Pl., West Vancouver, British Columbia, Canada

Filed Feb. 28, 1972, Ser. No. 229,733
Int. Cl. A63b *71/02*
U.S. Cl. 273—95 A **2 Claims**



Game apparatus providing fun and exercise for two players, apparatus having weighted body secured to flexible tension link having two ends, each player holding an end. By swinging hands and moving rapidly, weighted body can be thrown between players, players attempting to avoid being hit by weighted body. Link length and elasticity determine dynamic characteristics of apparatus. Elasticity easily varied by changing link material and for fine adjustment of link characteristics a composite link can be made in which link has elastic and inelastic materials arranged in parallel or series relationship. Dynamic characteristics of apparatus effect physical demands on players, and by selection of particular dynamic characteristics physical demands on players can be controlled.

3,814,428

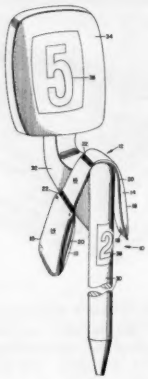
ROTATIONAL ENERGY ABSORBING TARGET AND PROJECTILE

Charles Frederick Foley, 3908 Merriam Rd., Minnetonka, Minn. 55343

Filed Apr. 13, 1973, Ser. No. 350,833
Int. Cl. A63b *71/02*
U.S. Cl. 273—95 R **1 Claim**

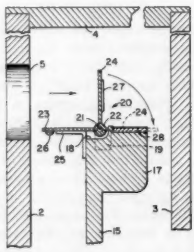
Game apparatus comprising targets and missiles, the missiles each comprising a pair of weighted bags joined by a flexi-

ble web, the targets each comprising a stake having an arm extending outwardly therefrom adjacent its upper end, a missile



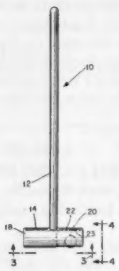
when thrown at a target being adapted to drape on the arm thereof.

3,814,429
MOVING PIVOTED INDICATING TARGET
Julius Caesar Lienhard, 9317 Lakeland Ct., Richmond, Va. 23229
Filed Nov. 1, 1972, Ser. No. 302,831
Int. Cl. A63b 7/12
U.S. Cl. 273—102.1 E **5 Claims**



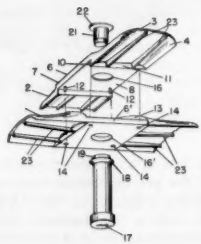
An educational and amusement device embodying a casing having a viewing opening and a wheel journaled in the casing for rotation by power means, about a normally horizontal axis and having a number of targets mounted on its periphery for sequential display through the opening. Each target when struck by a missile projected through the opening, is thereby pivoted about a chordal axis of the wheel, into a position displaying the fact of a hit or correct aim.

3,814,430
BALL GAME PLAYED WITH MALLETS
Dubi A. Leumi, Philadelphia, Pa., assignor to Andrew G. Gay, Philadelphia, Pa.
Filed June 18, 1971, Ser. No. 154,306
Int. Cl. A63b 59/00, 63/00
U.S. Cl. 273—118 R **2 Claims**



A game includes a number of mallets for hitting a ball. Each of the mallets includes head members having a solid end portion for striking the ball and a hollow portion for receiving the struck ball.

3,814,431
TOY PLASTIC BOOMERANG
Paul J. Callahan, 9762 Greenwood, Montclair, Calif. 91763
Filed Sept. 11, 1973, Ser. No. 396,196
Int. Cl. A63b 65/00
U.S. Cl. 273—106 D **7 Claims**

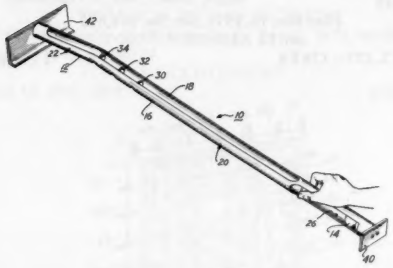


A toy plastic boomerang having two interconnected wings arranged for free rotation on a vertical hollow handle with ballast therein to control the speed of descent. To propel, the user grasps one wing between the fingers so that the wings extend vertically with the handle extending laterally and throws the boomerang forward and vertically at a slight upward arc of approximately 45°.

3,814,432
TUBULAR TRACK MARBLE GAME APPARATUS
Ervin W. Rose, 3625 Manor Dr., Highland, Ind.
Filed Feb. 1, 1973, Ser. No. 328,499
Int. Cl. A63f 7/00
U.S. Cl. 273—123 R **8 Claims**

A game device in which an elongated track has an ascending section and a descending section and balls are disposed in said track and confined therein. Spaced slots are provided in the ascending section for receiving the balls which, when not in play, rest in the lower end of said ascending section, in position to be grasped by a player to propel the balls upwardly along the ascending section into the slots. If too much force is

used in propelling the balls, they pass over the slots and enter the descending section. A spring may be provided at the lower end of the descending section to cause the balls to rebound to



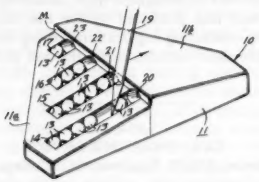
the slots. While the track is preferably of tubular construction and only slightly larger in inside diameter than the balls, the track may be of other configurations.

3,814,433

GAME BOARD WITH MOVABLY ATTACHED PIECES

Harrison Clay Mellor, 194 Providence Rd., Newtown Square, Pa. 19144

Filed May 4, 1973, Ser. No. 357,245
Int. Cl. A63f 3/00, 7/00
U.S. Cl. 273—132 **8 Claims**



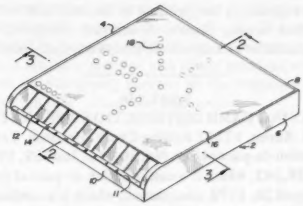
A game of strategy designed to be played by two players includes a playing board and a series of playing pieces displaceable relative to the board from a first playing position and to a second playing position. The playing pieces are preferably small metal balls which are retained in parallel grooves in the first playing position and which are displaceable into a like series of pockets which are located in the second playing position. Each groove is of a different length and contains a different number of balls. The total complement of balls associated with the board may be an odd or an even number. In the illustrated embodiment, the arrangement of the board is designed to provide a sufficient number of groupings, and variations in the number of playing pieces in each grouping, so that the game is both challenging and attractive. Of course, the number of grooves and the number of playing pieces contained within each groove may be varied without affecting the method of play or the object of the game. Preferably, the grooves and pockets slope downwardly from their junctures for causing the balls to be biased by gravity into either the first or second playing positions. In playing the game, the players take alternate turns with each player being permitted during his turn to displace as many balls as he wishes from whichever one of the grooves he chooses into the pocket associated therewith. The object of the game is for each player to select the number of balls displaced during his turn in such a manner as to require his opponent to displace the last ball remaining in all of the grooves into its pocket when his turn comes. A variation of the game may be played with the same rules, except that the winner is determined as the player who plays the last ball.

3,814,434

BOARD GAME APPARATUS

Harry J. Robinson, 102 Country Club Dr., Marietta, Ohio 45750

Filed May 2, 1972, Ser. No. 249,709
Int. Cl. A63f 3/00
U.S. Cl. 273—134 G **4 Claims**



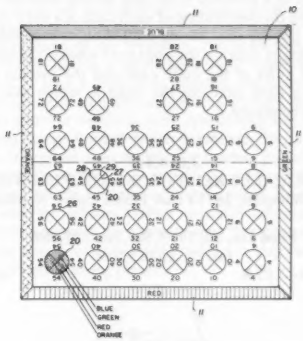
A game using moveable playing pieces which includes a box with an inclined bottom and walls having recessed edges, which box further contains a plurality of substantially parallel channels of varying width which overlie the inclined bottom. The game further includes an apertured playing surface which may be fitted in the recessed edges so that it overlies the channels, the apertures being arranged in a path along which the playing pieces are moved under the control of a die, some of the apertures being dimensioned to allow the playing pieces to pass therethrough into the channels from which point they may progress by gravity to a game scoring area.

3,814,435

EDUCATIONAL GAME

Willis T. Stratton, Camarillo, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 13, 1973, Ser. No. 332,235
Int. Cl. A63f 3/06
U.S. Cl. 273—135 B **2 Claims**



An educational game for the teaching of multiplication in a competitive game of skill, utilizing a special game board, a deck of special playing cards, and a set of distinctively colored markers.

The game board is square in shape, with a series of circles imprinted thereon such that the circles are aligned along imaginary lines parallel to the perpendicular sides of the board. Each such circle is marked with a number representing the product of two factors. This number is located about the periphery of the circle at four different locations and is positioned so that at each location it is oriented parallel to a different one of the four sides of the board. Each circle is divided into segments each segment identified by a different color cor-

responding to the color of one player's markers. The deck of playing cards consists of a quantity of playing cards of an equal or greater number than the quantity of circles marked on the board, with each playing card marked with two factors which when multiplied represent a product encircled on the game board.

The players each draw a card in turn, and each attempts to identify the correct numeral — marked circle on the playing board that represents the product of the two factors shown on the card that he has drawn. A marker, identified with the player, is placed over each circle that is correctly identified.

3,814,436

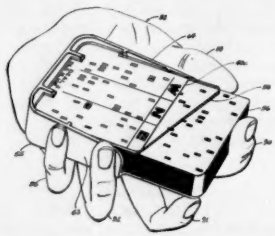
PLAYING CARD DISTRIBUTION APPARATUS

William M. Boren, 17327 Rolling Creek, Houston, Tex. 77090

Continuation-in-part of Ser. No. 50,786, June 29, 1970, Pat. No. 3,658,342, which is a continuation-in-part of Ser. No. 30,314, April 20, 1970, abandoned, which is a continuation of Ser. No. 734,429, June 4, 1968, abandoned. This application Apr. 24, 1972, Ser. No. 246,977

Int. Cl. A63f *1/14*

U.S. Cl. 273—149 P **3 Claims**



The disclosure is of an apparatus for enabling distribution of playing cards into predetermined groups, or "hands," for the game of Duplicate Bridge. The determination of distribution of the playing cards into four hands or sets of equal number is made by use of a punched code card having punches or holes for indicating the distribution of each card of a deck of playing cards, each playing card having printed on its back side a code corresponding to holes of the code card whereby matching superimposed holes of the code card and the printed code of each playing card indicates the hand in which that playing card should be placed.

3,814,437

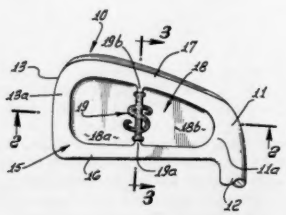
SYMBOLICALLY REINFORCED GOLF CLUB HEAD

S. William Winquist, 26714 Oak Pluma Court, Newhall, Calif. 91321

Filed Jan. 30, 1973, Ser. No. 327,988

Int. Cl. A63b *53/04*

U.S. Cl. 273—167 R **5 Claims**



The recessed back side of a golf club head is provided with integral monogram ribbing in such manner as to aid the play of both high and low handicap players.

3,814,438

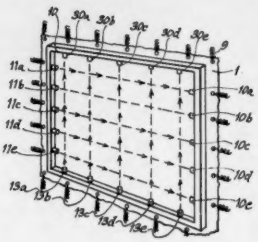
GOLF GAME APPARATUS

Philip N. Baron, 5333 N. Kenamore Ave., Chicago, Ill. 60640, and Bernie Schulman, 4250 N. Marine Dr., Chicago, Ill. 60613

Filed Dec. 16, 1971, Ser. No. 208,853

Int. Cl. A63b *69/36, 67/02*

U.S. Cl. 273—176 FA **2 Claims**



Apparatus for improving one's golf game, in which the ball is hit from a contact location to a flexible sheet member. The sheet member has a selected flexibility to permit the ball contacted portion thereof to flex and thereby break one of a plurality of light beams directed to photosensitive elements on the side of the sheet member opposite the ball contact location. A readout device is provided for indicating to the player the area of the sheet member where the ball was received and the distance that the ball would have traveled. The registration system is inhibited or prevented from indicating any registration other than that produced by the first hit, in order to eliminate any conflicting registrations arising from secondary flexings of the sheet member wehn the ball strikes the sheet member.

3,814,439

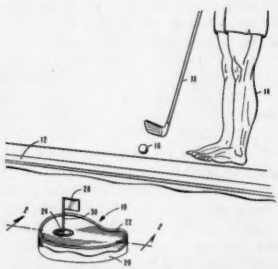
GOLF PRACTICE DEVICE

Max M. Simon, 22057 Vanowen St., Canoga Park, Calif. 91303

Filed Jan. 29, 1973, Ser. No. 327,629

Int. Cl. A63b *69/36*

U.S. Cl. 273—181 R **2 Claims**

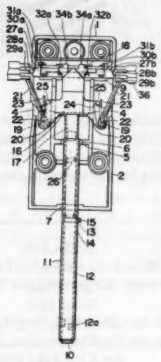


A floatable device for golfers for practicing chipping or short approach shots. The device is in the shape of a common golf green and may be made of a cellular plastic material, such as "Styrofoam," or from a member which may be inflated by air. The device includes a top covering of artificial grass bristles and a cup and flag stick to simulate a golf green and hole. The device may be anchored at a particular location in a body of water by weight members hanging from the bottom of the device.

3,814,440
INTERCHANGEABLE RECORD CHANGER SPINDLE ASSEMBLY

Tomoo Aisumi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1972, Ser. No. 301,249
Claims priority, application Japan, Nov. 4, 1971, 46-88123; Nov. 4, 1971, 46-88124
Int. Cl. G11b *17/04*
U.S. Cl. 274—10 S **6 Claims**

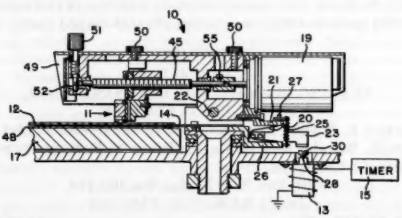


An interchangeable record changer spindle assembly for use in a phonograph or record player in association with records each having a relatively large center hole through which the records are mounted on the record changer spindle assembly in a vertically stacked arrangement. The spindle assembly essentially comprises a housing structure, a slider block vertically slidably housed within the housing structure and pivotally carrying a pair of supporting members for supporting the lowermost one of the records when the slider block is in an upwardly shifted position and for permitting the lowermost record to fall on to the phonograph turntable when in a downwardly shifted position. Also included are a pair of clamping members horizontally alidably housed within the housing structure and movable close to and away from each other for supporting the records except for the lowermost one when the latter is to be fed on to the phonograph turntable in response to the operational mode of the slider block.

3,814,441
RECORDING ARM SAFETY LIFTER

Lester R. Craggs, Nevada City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Sept. 21, 1972, Ser. No. 290,955
Int. Cl. G11b *3/10, 5/00*
U.S. Cl. 274—23 R **5 Claims**

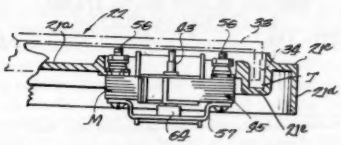


There is disclosed a disc type magnetic recording and playing system wherein a recording arm tracks over concentric circular tracks in a flexible magnetic disc. There is also disclosed apparatus for swinging the recording arm into position with the record/playback transducer centered within a given track, and a stepping motor for stepping the transducer from track to track. A safety lifting device is provided for prevention of excessive wear of any one track. The safety lifting device is under the control of a solenoid which in turn is energized through a timer. When any of several operating controls are activated the timer is set and the solenoid is energized. After a predetermined period of time, the timer deenergizes the solenoid, and the arm is raised automatically. Raising of the arm is accomplished by a spring which works against the solenoid so that there is always a positive arm lifting moment which in the absence of an energizing current to the solenoid, raises the arm. Thus "fail safe" operation is provided.

3,814,442
PHONOGRAPH RECORD PLAYER

Robert L. Van Antwerp, Saint Joseph, Mich., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 20, 1972, Ser. No. 235,971
Int. Cl. G11b *3/60*
U.S. Cl. 274—39 A **19 Claims**



A phonograph record player is provided wherein a turntable drive mechanism is mounted within a well formed in a supporting base, the turntable having a depending flange which nests in an annular well portion of greater depth. Mounted on the surface forming the bottom of the well is a drive means for effecting rotation of the turntable. The drive means includes motive means having a rotatable upright shaft member, the upper end of which terminates adjacent the underside of the turntable and in driving contact with a vertically adjustable rotary idler member which, in turn, is in driving contact with the depending flange formed on the turntable. The upright shaft member is supported by an interior bearing projecting axially downwardly from the lower end of the member into the motive means. A tone arm and activating means therefor are included and the system further includes automatic sensing means which controls the speed of the turntable and the place where the tone arm engages the record in dependence upon the type of record being played.

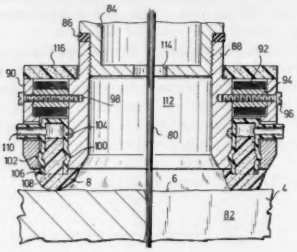
3,814,443
SEALING MEANS

Karl-Heinz Steigerwald, Munich, Germany, assignor to Steigerwald Strahltechnik G.m.b.H., Munich, Germany

Filed Oct. 28, 1969, Ser. No. 871,891
Claims priority, application Germany, Oct. 28, 1968, 1805719
Int. Cl. F16j *9/00, 15/00*
U.S. Cl. 277—5 **26 Claims**

Sealing means for sealing spaces between at least two bodies comprising a magnetic influencable sealing compound positionable between said bodies and at least one magnetising

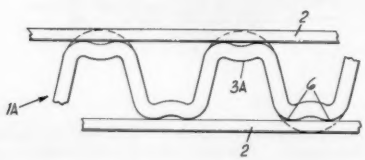
device for magnetisation of said sealing compound to form a sealing lip extending between said parts; said sealing compound being flowable in at least the non-magnetised state and adapted to stiffen under the influence of a magnetic field.



3,814,444
LOW FRICTION PISTON RING

Stephen I. Johnson, and Harry B. Thompson, both of Hastings, Mich., assignors to Hastings Manufacturing Company, Hastings, Mich.

Filed July 18, 1972, Ser. No. 272,983
Int. Cl. F16j *9/06;* **F02f** *5/00*
U.S. Cl. 277—139 **5 Claims**



Thin annular steel rails, split radially, are arranged flatwise on opposite sides of a corrugated annular expander, with shoulders on the expander engaging the radially inner edges of the rails. The area of contact between the rails and the expander is reduced to decrease friction by:

A. forming radially extending peaks on the corrugations of the expander to present line contact areas to the sides of the rails.

B. Reducing the axial height of alternate corrugations of the spacer, to reduce the number of contact points between the expander and the rails.

C. Forming narrow axially extending annular projections on the faces of the rails to form line or point contacts with the corrugations on the spreader.

D. Shaping the shoulders on the spacer to present line contacts with the inner edges of the rings.

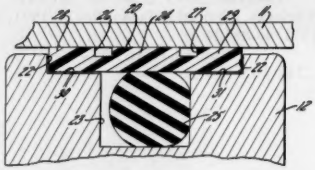
E. Combinations of A, B, C and D.

3,814,445
SEAL ASSEMBLY

James A. Bitzan, St. Cloud, Minn., assignor to DeZurik Corporation, Sartell, Minn.

Filed Feb. 10, 1972, Ser. No. 225,120
Int. Cl. F16j *15/34, 15/40*
U.S. Cl. 277—165 **6 Claims**

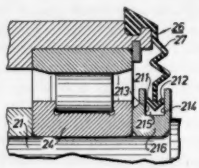
An improved seal assembly includes a "Teflon" seal ring of rectangular cross-section and a resilient O-ring disposed in a stepped circumferential recess in the piston of a linear actuator. Two axially spaced grooves in the outer surface of the seal ring opposite the sidewalls of the inner portion of the stepped recess concentrate the sealing force of the compressed O-ring on the central portion of the seal ring. The edges of the seal ring outboard of the grooves are positively backed-up by shoulders in the stepped recess to prevent twisting and roll out of the seal assembly. The seal ring is loosely fit into the outer portion of the stepped recess to reduce friction on the leading and trailing edges and to admit entrance of the fluid medium from the high pressure side of the piston into the step recess to increase the sealing force exerted by both the seal ring and the O-ring.



3,814,446
SEALING ARRANGEMENT

Karl Gustav Derman, Sorgardsvagen 7, S-430 70 Savedalen, Sweden

Filed Jan. 26, 1972, Ser. No. 220,967
Claims priority, application Sweden, Jan. 26, 1971, 871/71
Int. Cl. F16j *15/32*
U.S. Cl. 277—169 **6 Claims**



A seal adapted to be mounted between inner and outer members which are rotatable relative to one another, one of said members having opposing sealing surfaces, comprising an annular element having inner and outer portions connected by a flexible membrane, one of said portions defining a locking means for securing the annular element to the other of said members, the other portion of said annular element remote from said one portion defining a sealing element adapted to be compressed axially between opposing sealing surfaces of said one member and comprising two annular sliding sealing faces disposed on opposite sides of said membrane for sliding sealing contact with said sealing surfaces, said membrane being flexible in an axial direction so that the contact pressures of the sliding sealing faces in the axial direction adjust to substantially the same value as each other, at least one of said annular sealing portions comprising an open funnel-shaped sealing lip.

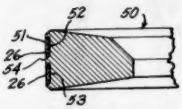
3,814,447
SEALING ELEMENT FOR USE IN INTERNAL COMBUSTION ENGINES

Herbert F. Prasse, Town & Country, and Harold E. McCormick, Ballwin, both of Mo., assignors to Ramsey Corporation, St. Louis, Mo.

Filed Nov. 2, 1972, Ser. No. 303,114
Int. Cl. B32b *15/18;* **F16j** *9/00*
U.S. Cl. 277—224 **23 Claims**

Sealing elements for use in internal combustion engines, such as piston rings for reciprocating pistons, seals for rotary pistons in engines of the type generally referred to as the Wankel engine, and similar structures in which a sealing element

having a hard, wear-resistant bearing surface provides a seal between relatively movable slidable surfaces to prevent or substantially reduce flow therebetween of fluids such as combustion gases, oil films and the like. Such hard, wear and scuff-resistant facings, coatings and the like are preferably provided by the plasma jet application to the peripheral bearing surfaces of the sealing elements of alloy-forming compositions



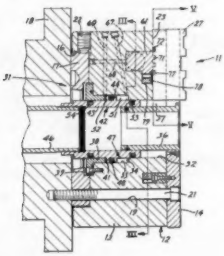
comprising effective proportions of a tungsten carbide-cobalt aggregate; molybdenum; and a nickel-chrome-boron-silicon alloy. For best results the plasma-applied final coating is substantially free from such detrimental components as nickel in its free state and aluminum oxide. If the nickel is present only in a combined form, as it is in nicrome (a nickel-chrome alloy containing about 60% Ni), the nickel has no detrimental effect.

3,814,448

HYDRAULIC CHUCK

James R. Buck, Kalamazoo, Mich., assignor to Buck Tool Company, Kalamazoo, Mich.

Filed Oct. 16, 1972, Ser. No. 297,632
Int. Cl. B23b *31/30*
U.S. Cl. 279—1 J **13 Claims**



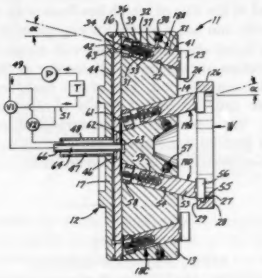
A chuck construction comprising a chuck body having a plurality of substantially radially movable jaw carriers slidably mounted thereon. At least one jaw carrier is drivingly connected to a driven piston which is slidably mounted on the chuck body. In one embodiment a driving piston is slidably mounted relative to the chuck body and, in association with the chuck body, defines a fluid pressure system which actuates the driven piston whereby movement of the driving piston, acting through an intermediate pressurized fluid, causes movement of the driven piston and its associated jaw carrier. The driving piston is connected to an actuating mechanism, such as a conventional draw bar. In one embodiment, all of the jaw carriers are connected to separate driven pistons which are operatively related to the fluid pressure system so that the driven pistons and their respective jaw carriers are individually slidably moved when the driving piston is moved. This chuck construction permits relative radial movement of the jaw carriers to compensate for workpiece eccentricity. In a further embodiment, the jaw carriers are mechanically interconnected to each other for simultaneous radial movement therewith and with this arrangement one or more jaw carriers as desired may be connected to a driven piston.

3,814,449

HYDRAULIC RING CHUCK

James R. Buck, Ross Township, Kalamazoo County, Mich., assignor to Ruck Tool Company, Kalamazoo, Mich.

Filed Oct. 5, 1972, Ser. No. 295,205
Int. Cl. B23b *31/30*
U.S. Cl. 279—1 J **3 Claims**



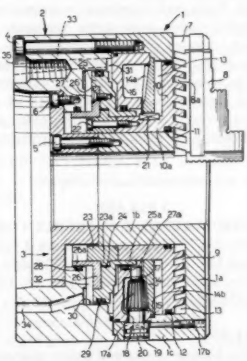
A chuck construction comprising a chuck body having a first set of jaw carriers slidably mounted thereon and disposed for gripping engagement with the external surface of a ringlike workpiece. The chuck body has a second set of jaw carriers slidably mounted thereon and disposed inwardly of said first set for permitting gripping engagement with the internal surface of said workpiece. The jaw carriers are all mounted for movement in a direction having a component of motion extending radially of said chuck body. A piston is associated with each jaw carrier. The pistons associated with the first set of jaw carriers are in fluid communication with a pressure source to permit activation of said first set of jaw carriers. The pistons associated with the second set of jaw carriers are also connectible to a fluid pressure source. The individual jaw carriers of said first and second sets are relatively movable with respect to each other to permit same to compensate for workpiece eccentricity.

3,814,450

SELF-CENTERING CHUCK

Mario Bertorello, Turin, Italy, assignor to Rotomors S.R.L., Turin, Italy

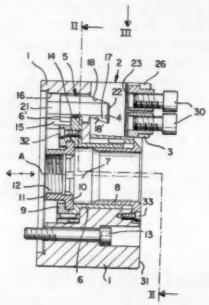
Filed Dec. 6, 1972, Ser. No. 312,539
Claims priority, application Italy, Jan. 19, 1972, 67162/72
Int. Cl. B23b *31/16*
U.S. Cl. 279—4 **6 Claims**



A self centering chuck of the type having radially sliadable jaws with rearwardly directed inclined teeth engaging in a

spiral channel which has correspondingly inclined sides formed in the front face of an axially slidable annular disc within the body of the chuck. Axial displacement of the annular disc thus causes the jaws to make short clamping or release movements due to the inclination of the teeth and the sides of the spiral channel. The radial position of the jaws can also be adjusted by rotating the annular disc, and for this purpose it is linked to a crown wheel which engages a transverse bevel wheel the end of the axis of which lies flush with the surface of the chuck body and has a recess for engagement with a suitable tool. The bevel wheel is provided with means for clamping it against rotation once manual adjustment of the position of the jaws has been effected. The chuck body incorporates a fluid pressure cylinder linked to the annular disc, and the chuck body has openings for communication with correspondingly located openings of pressure fluid conduits in a machine tool on which the chuck is mounted.

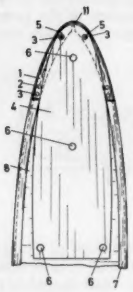
3,814,451
MULTIPLE-JAW-CHUCK
Gunter Horst Rohm, 7927 Sontheim/Brenz, Germany
Filed Aug. 7, 1972, Ser. No. 278,622
Claims priority, application Germany, Aug. 7, 1971, 2139718
Int. Cl. B23b *31/16*
U.S. Cl. 279—121 **8 Claims**



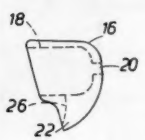
A three-jaw chuck has a body rotatable about an axis and three jaw supports received in radially extending slots in one of its faces. Three drivers are slidable in bores extending axially in the chuck body and terminate in respective camming heads with sloping inner and outer surfaces received in similarly inclined recesses of the associated jaw supports. A control sleeve positively coupled with all the drivers can be axially displaced to move the jaw supports radially in or out. Each driver and each jaw support has a pair of laterally extending ribs or wings which are slidable in pairs of orthogonally adjoining grooves or flutes formed in the chuck body.

3,814,452
PLASTIC MATERIAL SKI STRUCTURE
Anton Arnsteiner, A-5730 Mittersill, Klausen 3, Austria
Filed Jan. 17, 1973, Ser. No. 324,449
Claims priority, application Austria, Jan. 18, 1972, 410/72; Apr. 17, 1972, 3353/72
Int. Cl. A63c *5/12*
U.S. Cl. 280—11.13 L **6 Claims**

A ski structure having upper and lower spaced ski surface layers and an intermediate foamed plastic core, steel ski edges and a ski tip protector adjoining the leading ends of the ski edges, a laminated glass insert positioned in the forward end of the ski so as to overlap the region of juncture between the ski tip and edges and being connected to at least the ski tip protector so as to form a reinforcing structure at the region of juncture while concurrently providing a retainer for the ski tip protector.



3,814,453
HOCKEY SKATE END CAP
John Staples, Slough, England, assignor to Mitchel & King Skates Limited, Slough, England
Filed Mar. 6, 1972, Ser. No. 232,010
Claims priority, application Great Britain, Mar. 24, 1971, 7730/71
Int. Cl. A63c *3/12*
U.S. Cl. 280—11.17 **2 Claims**

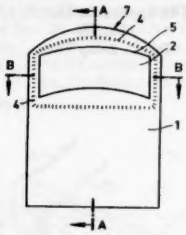


An ice skate which includes a longitudinally extending, tubular reinforcing member for the blade, and in which the rear end of the tube is formed as a dome with a central aperture. This aperture receives a screw for attachment of a guard having a tubular body to surround the end of the tube, and an end portion which overhangs the end of the blade.

3,814,454
SLIDE PLATE BETWEEN SKI BOOT SOLE AND SKI SURFACE IN RELEASING SKI BINDINGS
Jean Joseph Alfred Beyl, 10 Boulevard Victor Hugo, 58 Nevers, France
Filed Aug. 1, 1972, Ser. No. 277,107
Claims priority, application Germany, Aug. 25, 1971, 2142678
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 C **4 Claims**

A sliding plate, for use between a ski boot sole and a ski surface in a releasable ski binding, is of the kind comprising a bearer fixable to the ski surface and having a sliding strip mounted at its upper part, and is characterised in that the bearer is formed by a large-surfaced bearing body, relative to

said sliding strip, made of a material resistant to mechanical stress, and especially polyethylene resin plastics, and in that



said sliding strip is mounted on said bearing body with its surface only slightly protruding above the upper part of the bearing body which surrounds the sliding strip.

3,814,455

APPARATUS FOR COMPENSATING FOR THE LONGITUDINAL MOVEMENT OF A SAFETY SKI BINDING

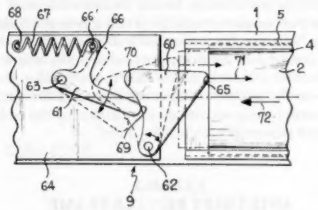
Georges Pierre Joseph Salomon, 34 Avenue de Laverchy, Annecy, France

Division of Ser. No. 107,254, Jan. 18, 1971, Pat. No. 3,734,522. This application Mar. 19, 1973, Ser. No. 342,468

Claims priority, application France, Jan. 19, 1970, 70.01826

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **7 Claims**



The disclosure herein describes an apparatus for compensating for the longitudinal movement of a safety ski binding and thereby protecting the skier when falling. To achieve this aim, the moving part of the ski binding is subjected to the action of a resilient force which resists the displacement of the moving part in one direction; this resilient force varies as a function of the moving part and, at the same time it varies, the component of this force which acts on the moving part of the binding parallel with the direction of movement thereof, is maintained at an appreciably constant value.

3,814,456

FORK LIFT TRUCK

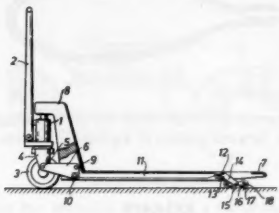
Anders Ivar Bryntse, Mjolby, Sweden, assignor to AB Bygg- och Transportekonomi (BT), Bromma, Sweden

Filed Nov. 17, 1972, Ser. No. 307,388

Int. Cl. B62d *21/18*

U.S. Cl. 280—43.12 **9 Claims**

In a height-adjustable fork lift truck, or the like, having a forwardly projecting portion supported on rolling means, means is provided for selectively raising and lowering the forwardly projecting portion of the truck relative to the rolling means, the raising and lowering means including a fork arm carrying a rolling means and being pivotally connected to the forwardly projecting portion of the frame. A motion-transmitting mechanism is coupled to the frame and is pivotally connected to the fork arm via a second pivot means in order to impart rotation to the fork arm in a direction dependent upon the direction of motion of the frame of the truck relative to its



support wheels in order to thereby correspondingly lift or lower the forwardly projecting portion of the frame. Each of the pivot means connecting the fork arm to the forwardly projecting portion and to the motion-transmitting mechanism comprises respective multiple-shear pivot junctions in order to improve the structural strength characteristics of the truck.

3,814,457

VEHICLE BODY WITH BOX-SHAPED HOLLOW BEARER

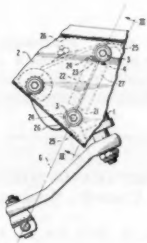
Albert Baur, Altingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 7, 1971, Ser. No. 187,277

Claims priority, application Germany, Oct. 7, 1970, 2049214

Int. Cl. B62d *25/00*

U.S. Cl. 280—106 **8 Claims**



A vehicle body with a box-shaped hollow bearer, on which is secured a unit, for example, a steering gear, by means of a threaded connection including two fastening bolts extending through the hollow bearer; the hollow bearer is thereby provided within the area of the securing places of the two fastening bolts with a support body internally reinforcing the hollow bearer; the support body, in turn, is reinforced within the area where the fastening bolts extend through the same, by welded-in pipe sections while the support body which may be in the form of a sectional member, has a web that extends substantially along a straight line connecting the axes of the two fastening bolts.

3,814,458

HEAT AND KINETIC ABSORPTION LINING FOR AIR BAG

Steven N. Acs, Sarina, Ontario, Canada, assignor to Allied Chemical Corporation, New York, N.Y.

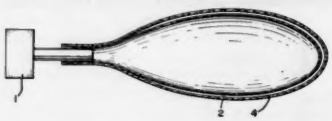
Filed Sept. 10, 1971, Ser. No. 179,397

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **2 Claims**

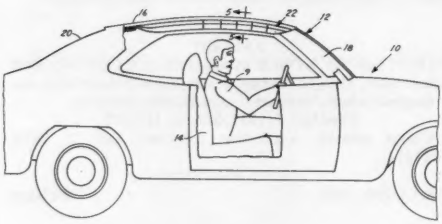
This invention relates to combined heat and kinetic energy absorption in a passenger restraint system as a result of the use

of a barrier contained within the passenger restraint bag. More specifically, this invention relates to the introduction of non-elastic, but independent, heat and kinetic energy absorbing



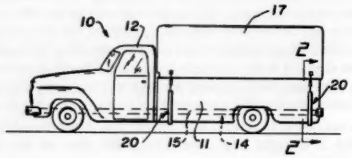
bag or other barrier material within the air bag which is utilized to restrain forward motion of a passenger within a motor vehicle.

3,814,459
VEHICLE PASSENGER CRASH PROTECTOR
Robert E. Eckels, 2101 Youngfield St., Golden, Colo. 80401
Filed Mar. 27, 1972, Ser. No. 238,455
Int. Cl. B60r *21/02*
U.S. Cl. 280—150 B **3 Claims**



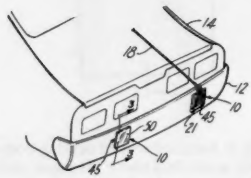
Vehicle passenger shock attenuating crash protector, mounted adjacent the roof of a vehicle on the inside, slides forwardly and downwardly in front of the vehicle passengers on a forward directed impact of the vehicle with another object.

3,814,460
LOAD SECURING APPARATUS FOR PICKUP TRUCKS
John H Norrish, 817 Crace St., Nanaimo, British Columbia, Canada
Filed Jan. 15, 1973, Ser. No. 323,999
Claims priority, application Canada, Dec. 15, 1972, 159151
Int. Cl. B60p *3/32*
U.S. Cl. 280—179 R **5 Claims**



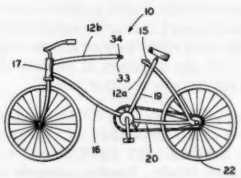
Apparatus for securing a camper directly to a frame of a truck and including a crossbar which extends beneath the longitudinal frame members of the truck. Spacer blocks are placed between the crossbar and the frame members in one of three alternative positions of use according to the space available beneath the truck. The blocks and crossbar are secured to the frame member by clamping means having two alternative positions of use. Strpping means which are adjustable as to length attach the outer end of the crossbar to the sides of the camper.

3,814,461
CONCEALED TIE DOWN ANCHOR
Howard A. Rhody, 9312 Torrey St., Grand Blanc, Mich.
Continuation-in-part of Ser. No. 193,781, Oct. 29, 1971, Pat. No. 3,722,911. This application Mar. 5, 1973, Ser. No. 338,108
Int. Cl. B60p *7/00*
U.S. Cl. 280—179 R **9 Claims**



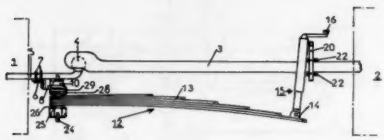
A tie down anchor mounted on a vehicle and adapted to facilitate the lashing down of a load carried by the vehicle. The tie down anchor has a housing with an opening extending through one wall of the housing. The housing is fastened to the interior wall surface of an exposed body portion of the vehicle such that the housing opening is aligned with a second opening extending through the vehicle body portion. An anchor movably secured to the inner wall of the housing opposite the housing opening is movable between a first position wherein the anchor projects outwardly through the body portion for attachment to a cable to facilitate the lashing down of the load carried by the vehicle and a second position wherein the anchor is retracted within the opening and positioned against the inner wall of the housing. A cover member having an exterior finish complementary to the exterior finish of the exposed body portion is movable between a first position within the housing wherein the cover extends through the housing opening and encloses the body portion opening and a second position wherein the cover is laterally moved within the housing to expose the anchor. Means are provided for biasing the cover outwardly while second means carried by the cover limit such outward movement.

3,814,462
ANTI-THEFT BICYCLE FRAME
James J. Kelly, 625 Valley View Rd., Oak Park, Ill. 19047
Filed Mar. 16, 1973, Ser. No. 342,068
Int. Cl. B62k *15/00*
U.S. Cl. 280—287 **5 Claims**



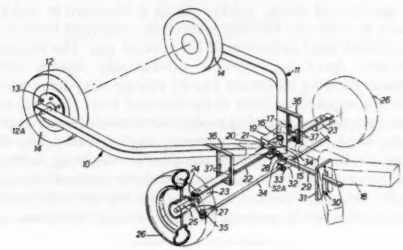
A bicycle frame has a two-part horizontal frame member or crossbar, a forwardly extending diagonal frame member pivotally connected to the pedal crank housing and a keylock connecting the two crossbar pieces together so that opening of the lock permits the frame to be opened, placed around a permanently located pole or the like and then re-locked to prevent removal of the bicycle without opening the lock.

3,814,463
STABILIZING AND ANTI-ZIGZAG DEVICE FOR CARAVANS AND TRAILERS
Roger Tunesi, 12 Montee Beaumur, Vienne, France
Filed Dec. 20, 1972, Ser. No. 316,784
Claims priority, application France, Dec. 20, 1971, 71.46668; Dec. 12, 1972, 72.44948
Int. Cl. B60d 1/16
U.S. Cl. 280—406 A 22 Claims



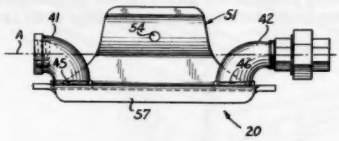
An anti-zigzag device for attaching caravans or road trailers to a vehicle is disclosed which includes at least one metallic connection piece, to the rear end of which the lower end of a jack is linked, the other end of said jack being removably coupled to the pole of the caravan, while a linking pin passes through the front portion of said connection piece and is provided with a lower locking nut to compress the stack constituted by the above-mentioned piece and a rotary friction damper. The projecting upper end of the pin is adapted to be removably fit into a coupling device integral with the rear of the hauling vehicle.

3,814,464
TRAILER COUPLING MEANS
Gordon Agar Wardill, Cranfield; David Carl Taube, Purley, and Alan Ananias Cornell, Frimley Green, all of England, assignors to Piggy-Back Tailer Rental Limited, London and Gordon Agar Wardill, Cranfield, both of, England
Filed Oct. 30, 1972, Ser. No. 301,749
Claims priority, application Great Britain, Nov. 3, 1971, 51136/71
Int. Cl. B62d 53/00
U.S. Cl. 280—476 R 11 Claims



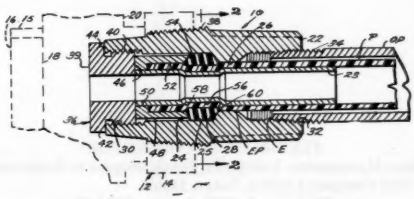
Arrangement for coupling a trailer drawgear to a towing road vehicle, in which a frame, arranged for pivotal connection with rear parts of the towing vehicle, carries at a rear part thereof a ball connector for receiving a socket connector secured on the trailer drawgear and below that ball connector a pair of steerable wheels, in which arrangement the wheels are steered by a lever pivoted on the frame and engaging in a steering device fixed on the trailer drawgear.

3,814,465
METER BAR CONSTRUCTION
Gordon A. Vangsness, 10209 Pacific Ave., Villa Park, Ill.
Filed Dec. 22, 1972, Ser. No. 317,640
Int. Cl. F16l 35/00
U.S. Cl. 285—30 1 Claim



A meter bar assembly formed of a flat elongated plate of metal having a pair of openings spaced to register with the nipples on a gas meter with plumber's elbows being welded to the plate in register with the nipples and oriented to provide threaded inlet and outlet connections facing in different directions. An integral upwardly extending flange is provided along the back edge of the plate and an integral downwardly extending flange is provided along its front edge. In the preferred embodiment the openings in the plate are sized to nestingly receive the flanges on the elbows.

3,814,466
SERVICE HEAD ADAPTER
Wilbur R. Leopold, Jr., Decatur, Ill., assignor to Mueller Co., Decatur, Ill.
Filed July 10, 1972, Ser. No. 270,301
Int. Cl. F16l 55/00
U.S. Cl. 285—55 7 Claims

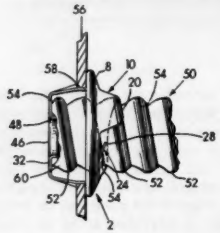


A service head adapter joint for connecting a new flareless plastic service pipe to a fitting, the new plastic service pipe being inserted through an existing service pipe, which may be metal, from the street main to the point of use for example a house. The existing service pipe while no longer functioning as a conduit for fluid still has utility as it protects the new plastic service pipe and is connected to the adapter joint. The fitting which is usually connected to the fluid distribution system of the house may be an elbow, tee, valve or another pipe extending into the house.

3,814,467
CONNECTOR FOR FLEXIBLE CONDUIT
Harold S. Van Buren, Jr., Lexington, Mass., assignor to TRW Inc., Cleveland, Ohio
Filed Apr. 17, 1972, Ser. No. 244,730
Int. Cl. F16l 5/02
U.S. Cl. 285—92 11 Claims

A connector for flexible conduit of the type which is spirally wound to provide continuous, alternating, helically contoured ribs and grooves thereon. The connector, which is formed

from spring sheet metal, includes an apertured socket having a dome-shaped web defining at its edge a single helix thread form adjacent the aperture in the socket. The helical edge of the web traverses a path corresponding to that of the helical grooves on the conduit whereby the conduit may be turned into the socket with the edge of the web advancing in the grooves and over the ribs in the manner of a nut thread on a bolt. A fitting joined to the socket carries an apertured disc spaced from the socket which the leading edge of the conduit



threaded through the socket ultimately engages to limit the length of the conduit which may be threaded into the connector. The fitting also carries snap acting legs adapted to secure the connector to an apertured support member, e.g., a junction box or an adapter connected to the junction box, when the fitting is inserted into the aperture in said support member. Additionally, the socket element carries a locking tab which both bitingly and tensionally engages the conduit to inhibit reverse rotation of same in a direction which would tend to disconnect the conduit from the connector.

3,814,468

FLEXIBLE PIPE CONNECTOR

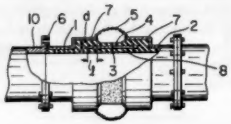
Tateo Mauramatsu, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 2, 1971, Ser. No. 167,932

Claims priority, application Japan, Aug. 10, 1977, 45-69294; Oct. 3, 1970, 45-86957

Int. Cl. F16l *13/00*

U.S. Cl. 285—114 **3 Claims**



A flexible pipe connector comprising at least one metallic end cylinder connectible to at least one of two pipes to be connected, an intermediate metallic cylinder disposed between the pipes being connected, a thermally-adhesive rubber layer bonding said intermediate cylinder to said end cylinder, and a tension-limiting means secured to parts integral with the pipes being connected so as to limit the flexure of the connector when the load to it exceeds a certain limit.

3,814,469

METHOD OF AND APPARATUS FOR LOOPING TAPE AROUND TAMPONS

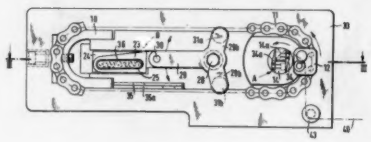
Stefan Simon, Modling, Austria, assignor to Dr. Carl Hahn GmbH, Dusseldorf, Germany

Filed Mar. 21, 1972, Ser. No. 236,626

Claims priority, application Germany, Mar. 21, 1972, 2114529

Int. Cl. B65h *69/04*

U.S. Cl. 289—1.5 **14 Claims**



Method of and apparatus for looping a double-thickness withdrawal tape around an absorbent cotton fleece used particularly for the manufacture of tampons for feminine hygiene.

3,814,470

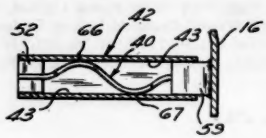
IMPACT ABSORBER

Thomas P. Kicher, South Euclid, Ohio, and Lawrence A. Nattrass, Okemos, Mich., assignors to Case Western Reserve University, Cleveland, Ohio

Filed Aug. 16, 1972, Ser. No. 281,177

Int. Cl. B60r *19/08;* **F16f** *7/00*

U.S. Cl. 293—70 **18 Claims**



A mechanical energy storage device is disclosed in which a column is elastically buckled to develop a constant force over an extended axial deflection of the column end. The constant deflection force produces a substantially square wave response allowing maximum energy storage in systems where limits are imposed on both deflection and force. Several embodiments disclose buckling mode control means for changing the buckling force into successively higher levels. The disclosed mode control means comprises restraining surfaces which restrict lateral deflection of column midportions and thereby cause the column to buckle into successively greater numbers of waves in response to increased end deflection.

3,814,471

GRAB BUCKETS

Yves G. Coeurderoy, Le Plessis-Belleville, France, assignor to Societe Anonyme: Poclaim, Plessi-Belleville (Qise), France

Filed Jan. 17, 1972, Ser. No. 218,072

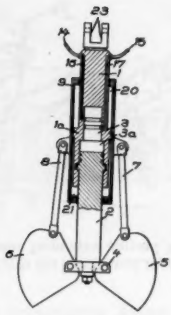
Claims priority, application France, Jan. 18, 1971, 7101530

Int. Cl. B66c *3/16*

U.S. Cl. 294—70 **8 Claims**

This invention relates to a grab bucket constituted by a double action jack comprising a piston rod in two parts, mounted coaxial and so as to rotate with respect to one another. This bucket comprises in addition a device for adjusting the angu-

lar orientation of the parts of the piston rod, this adjusting device being coupled directly to the said two parts of the rod.



One application of the invention is the manufacture of an orientable grab bucket which is compact and which has well protected control members.

3,814,472

AIR DEFLECTOR FOR VEHICLE

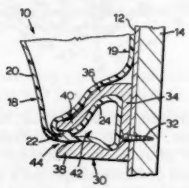
Joseph Zelikovitz, 214 Island Park Dr., Ottawa, Ontario, Canada (Kly-4j6)

Filed June 25, 1973, Ser. No. 373,390

Claims priority, application Great Britain, July 4, 1972, 31282/72

Int. Cl. B60j *1/04*

U.S. Cl. 296—1 S **10 Claims**



An air deflector for a vehicle, comprising an inflatable contoured bag having as a defined perimeter a separately inflatable bead, with air valves opening into the bag and into the bead. A frame attachable to a vehicle comprises a channel with a restricted slot whereby the deflated bead is receivable into the channel and retained in the channel when inflated.

3,814,473

PROTECTIVE INNER LINER FOR TRUCK BODIES

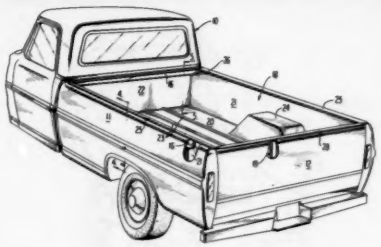
George Fred Lorenzen, Jr., Rt. 1, Box 71-F, Bartow, Fla. 33830

Filed Mar. 15, 1972, Ser. No. 234,880

Int. Cl. B62d *33/00*

U.S. Cl. 296—39 R **1 Claim**

The cargo box or body of a pick-up truck or the like has its interior surfaces completely covered and protected by a liner formed of plastics material or the like. The liner is formed to precisely fit the interior contours of the cargo box and to utilize the full cargo space to the maximum possible extent. The



liner protects the finish on the cargo box against scratching and corrosion. A separate liner element is provided for the interior of the truck tailgate.

3,814,474

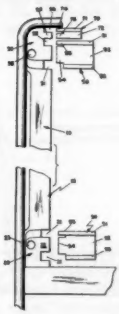
DETACHABLE TABLET ARM AND BOOKRACK

Richard H. Baker; Donald E. McNally, and Michael J. Armstrong, all of Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed June 7, 1972, Ser. No. 260,448

Int. Cl. A47b *35/00*

U.S. Cl. 297—160 **24 Claims**



This chair includes a detachable tablet arm and bookrack. The tablet arm includes a pair of supporting legs which pass beneath the air seat. Each leg includes a projecting tab which hooks into a receiving well created by a deformation in a seat supporting flange at the side of the chair. The ends of the legs are bolted to similarly formed receiving wells at opposite sides of the chair. The bookrack includes a platform which hooks over a crossbar joining the front legs of the chair. A supporting back projecting upwardly from the rear of the platform includes a pair of oppositely directed tabs for insertion into the rear receiving wells on the seat supporting flanges.

3,814,475

SEATS

Siegfried Slabon, Salzhemmendorf; Ludwig Kasten, Bad Munder, and Wilhelm Ritz, Oberelchingen, all of Germany, assignors to Wilkhahn Wilkening Hahne, Embeckhausen, Germany

Filed Nov. 24, 1972, Ser. No. 309,117

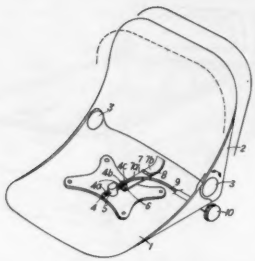
Claims priority, application Germany, Dec. 3, 1971, 455828

Int. Cl. B60n *1/02*

U.S. Cl. 297—361 **6 Claims**

The present invention provides a bucket seat, comprising a seat portion, a back rest portion, a hinge pivotally connecting

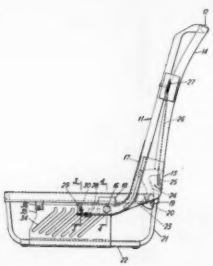
the seat portion to the back portion, and adjuster means connected to the back rest portion for continuous adjustment of the angle of tilt of said back rest portion relative to the seat portion.



3,814,476
VEHICLE SEATS

Edward George Abbott, Birmingham, England, assignor to British Leyland (Austin-Morris) Limited, Longbridge, England

Filed Apr. 24, 1972, Ser. No. 246,736
Claims priority, application Great Britain, Apr. 23, 1971, 11198/71; Feb. 22, 1972, 8063/72
Int. Cl. B60m *1/08;* **B60n** *1/02;* **A47c** *3/00*
U.S. Cl. 297—379 **4 Claims**



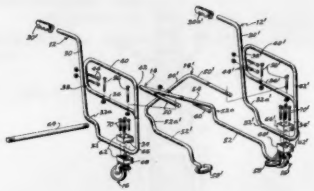
A vehicle seat having a forwardly foldable backrest pivoted to the seat frame has a manually releasable detent on the backrest and the detent is engageable with one of a series of fixed guides according to the fore and aft adjusted position of the seat. On forward tipping of the backrest, the detent moves along the selected guide which moves the seat forward to improve access to the rear seats whilst the detent may be released so that the seat may be adjusted and the detent then engages with another guide. The guides may comprise slots in a plate; the slots may be graded in length to prevent the top of the backrest hitting the steering wheel or facia, and the slots may include a vertical portion that is engaged by the plunger when the backrest is in the normal seating position to eliminate any vertical reaction between the slots and detent.

3,814,477
CHAIR

Erik B. Mattsson, 73 Hammond St., Jamestown, N.Y. 14701

Filed Aug. 25, 1972, Ser. No. 283,707
Int. Cl. A47c *5/04*
U.S. Cl. 297—419 **9 Claims**

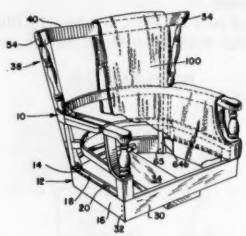
A wheeled chair construction having a frame formed by a pair of identical, parallel side frame members and a pair of essentially identical seat frame members each having seat and wheel support portions joined one to each of side frame members in a vertically spaced relationship and a vertically inclined connecting portion extending transversely adjacent the rear of the chair for connecting the seat and wheel support portions.



3,814,478
ARTICLE OF FURNITURE AND METHOD OF FORMING SAME

Edward L. Clark, Raleigh, N.C., assignor to Research corporation, New York, N.Y.

Division of Ser. No. 193,071, Oct. 27, 1971, Pat. No. 3,754,585. This application Feb. 16, 1973, Ser. No. 332,801
Int. Cl. A47c *7/00, 7/14*
U.S. Cl. 297—445 **8 Claims**



An article of furniture, such as a chair, has a basic horizontal frame structure, such as the seat frame, which is constituted by a pair of strip-like structural members that are formed to a desired common shape, such as arcuate, and arranged in a confronting, spaced apart, nested relation, such as concentric, and permanently joined in such relationship by bridging blocks or other spacers fixedly inserted in the gap between the members with the open spaces of the gap providing sockets for the fixed reception of mounting ends on the arm frames, back frame, and leg assembly. Such frame structure concept is applicable in the manufacture of top back rails, arms, rims and aprons and other such applications.

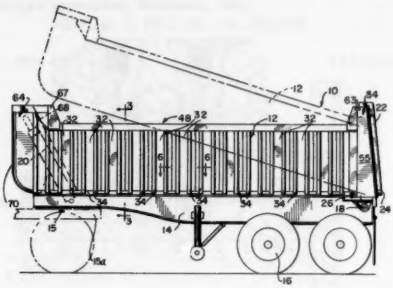
3,814,479
EXTRUDED DUMP TRAILER BODY

George F. Vornberger, Cincinnati, Ohio, assignor to Pullman Incorporated, Chicago, Ill.

Filed Nov. 20, 1972, Ser. No. 308,098
Int. Cl. B62d *29/02, 39/00;* **B60p** *3/12*
U.S. Cl. 298—23 M **10 Claims**

A dump truck extruded body having a plurality of adjacent and interconnected extruded panels which extend continuously about the sides and floor portion of the dump truck

body. The extruded panels include interlocking abutting seams to permit ease of attachment and also include integrally

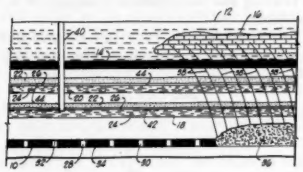


formed T-shaped strengthening flanges which extend the transverse length and height of each extruded panel.

3,814,480
METHOD OF CONTROLLING GAS ACCUMULATION IN UNDERGROUND MINES

H. Douglas Dahl, Ponca City, Okla.; J. Gilbert Davis, II, Morgantown, W. Va., and Peter L. Ehlers, Oklahoma City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 23, 1973, Ser. No. 344,183
Int. Cl. E21c *37/00*
U.S. Cl. 299—2 **10 Claims**



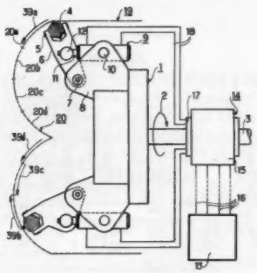
A method of preventing gas communication between a gas producing formation and a mine passage located therebelow. The method includes the drilling of a well bore into a fracturable rock formation disposed between the gas producing formation and the mine passage. The rock formation is then fractured and the fracture formed thereby is extended to the extent that the shear cracks to be formed by the subsidence of the overburden due to the collapse of the roof of the mine passage during the mining operation will intersect the extended fracture. Gas from the gas producing formation is allowed to flow through the shear cracks in the overburden to and through the fracture to the well bore where it is then vented to the atmosphere or otherwise suitably produced.

3,814,481
INTERMITTENT ADVANCING DEVICE FOR A ROTATABLE BORING MACHINE

Marcel Montacie, Paris, France, assignor to Union Industrielle Blanzy-Quest, Paris, France

Continuation-in-part of Ser. No. 152,839, June 14, 1971, Pat. No. 3,773,387, which is a continuation-in-part of Ser. No. 848,013, Aug. 6, 1969, abandoned. This application May 8, 1972, Ser. No. 251,141
Claims priority, application France, May 7, 1971, 71.16654
Int. Cl. E01g *3/04*
U.S. Cl. 299—61 **10 Claims**

Tool for a rotating head of a continuous boring or cutting machine, mounted on a tool-carrier fixed on the said rotating head and driven in a rotating sweeping movement in a plane passing through the axis of rotation of the said rotating head, performing regular work due to a discontinuous advance

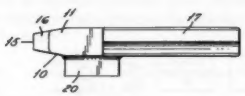


device, obtained by means linked to cylinders exerting a periodic thrust on the rotating head at each change in the direction of oscillation of the said tool-carrier.

3,814,482
CUTTING REMOVAL BIT FOR UNDERCUTTING MACHINE

Arnold B. Bower, Jr., St. Clair Shores, Mich., and Joseph C. Leighton, Bridgeport, W. Va., assignors to General Electric Company

Filed Oct. 30, 1972, Ser. No. 301,887
Int. Cl. E21c *35/18*
U.S. Cl. 299—79 **1 Claim**



A cutter bit of the type used in undercutting machines employed in mining has a projection on the side of the shank extending from a position near the shoulder or gage stop to a point near the cutting edge. The cutter bit is positioned in the socket of the undercutting machine with the projecting wiper or wipers on the sides of the bit. When the undercutting machine is in operation the cutting edge of the bit cuts chips and breaks out material from the face which falls underneath the machine cutter bar. The wiper projection then sweeps the cuttings from underneath the machine cutter bar thereby removing potential supporting material and enabling the undercut face to be broken up readily for efficient loading.

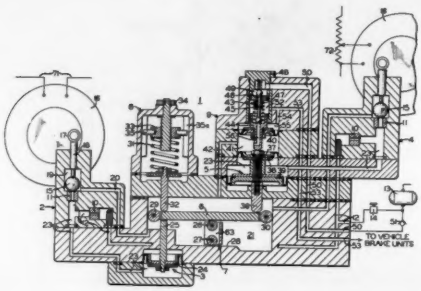
3,814,483
BLENDING VALVE DEVICE FOR COMBINING FLUID PRESSURE AND DYNAMIC BRAKES

Ronald W. Coiner, Irwin; Robert J. Bridigum, Pittsburgh, and Donald Brown, Monroeville, all of Pa., assignors to Westinghouse Air Brake Company, Urlmerding, Pa.

Filed May 22, 1973, Ser. No. 362,668
Int. Cl. B60t *13/74*
U.S. Cl. 303—3 **15 Claims**

A blending valve device subject to a brake command signal and a feedback signal representative of dynamic brake effort produced in response to said brake command signal, said signals acting in concert to rotate a control lever about an adjustable fulcrum for counteracting the effect of a control spring acting to rotate the lever in a direction to actuate a relay valve that provides fluid brake pressure according to the reduction of counteracting effect on the control spring,

thereby affording fail-safe fluid brake operation for supplementing the dynamic brake. The adjustable fulcrum serves to vary the lever ratio of the control lever and may be operative



responsive to variation in vehicle air spring pressure to accordingly vary the magnitude of fluid brake pressure with the vehicle load.

3,814,484

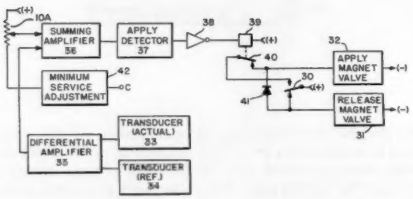
ELECTRONIC BRAKE CONTROL SYSTEM

William J. Matthews, Rochester, and Samuel J. Macano, Macedon, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Division of Ser. No. 155,186, June 21, 1971, abandoned. This application Jan. 19, 1973, Ser. No. 324,941

Int. Cl. B60t *13/68*

U.S. Cl. 303—20 **5 Claims**



A control system operates electro-pneumatic braking apparatus on a vehicle and includes an actuator for producing a signal proportional to desired braking effort from full release mode to a maximum. Sensor apparatus is responsive to a pneumatic parameter of the braking system for producing a signal indicative of the actual brake pressure while summing apparatus is responsive to the actuator apparatus and the sensor apparatus for producing outputs effective to operate the braking apparatus to release, apply, and lap modes in accordance with a selected difference in magnitude between the actuator apparatus and sensor apparatus signals.

3,814,485

VALVES FOR CONTROLLING THE FLOW OF HYDRAULIC FLUIDS

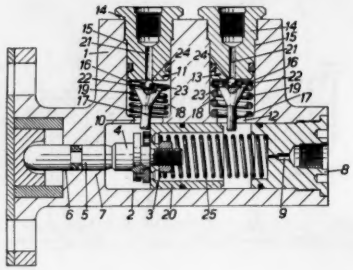
Barry Samuel John Robinson, Cabos near Garstang, England, assignor to Girling Limited, Tyseley, Birmingham, England

Division of Ser. No. 126,722, March 22, 1971, abandoned. This application Oct. 20, 1972, Ser. No. 299,397

Int. Cl. B60t *15/04*

U.S. Cl. 303—50 **3 Claims**

In a fluid-flow control valve of the tilting type an intermediate member interposed between a head and a seating has a surface portion complementary in outline to a rim comprising an adjacent end of an internal wall of the seating which defines a fluid flow passage or port. The surface portion is



movable into and out of seating engagement with the rim upon tilting or rocking movement of the head with respect to the seating.

3,814,486

HYDROSTATIC THRUST BEARING SUPPORTS

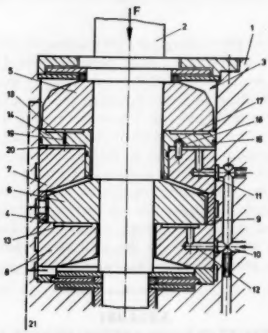
Rainer Schurger, Arnstein, Germany, assignor to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed July 28, 1972, Ser. No. 276,097

Claims priority, application Germany, July 31, 1971, 2138474

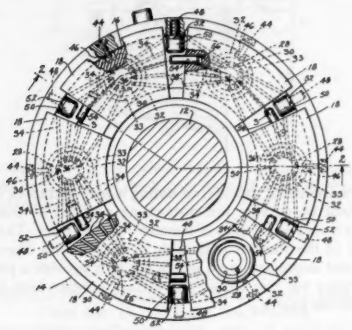
Int. Cl. F16c *17/04*

U.S. Cl. 308—160 **6 Claims**



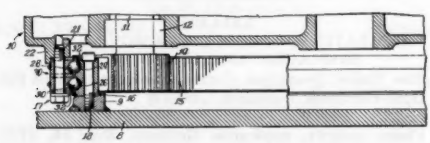
An arrangement for axially supporting a shaft or the like comprising a housing in which the end of the shaft is journalled. A hydrostatic thrust bearing is arranged along the end of the shaft within the housing. The thrust bearing comprises a first disk fixed relative to the shaft end, a second disk fixed relative to the housing and means for feeding fluid under pressure therebetween. An annular piston is arranged between the first and second disks to be axially movable, under action of the fluid, relative to and between said first and second disks, responsive to changes in pressure caused by external loading.

3,814,487
THRUST BEARING WITH PAD-RETAINING AND LUBRICATION MEANS
Willis W. Gardner, Waukesha, Wis., assignor to Waukesha Bearings Corporation, Waukesha, Wis.
Filed Jan. 8, 1973, Ser. No. 321,598
Int. Cl. F16c *17/06*
U.S. Cl. 308—160 11 Claims



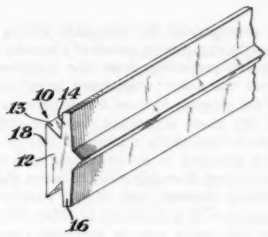
A plurality of tiltable thrust-bearing pads are supported in circumferentially spaced relationship around one face of a bearing retainer adjacent a rotatable thrust collar, the latter bearing against the outer faces of the bearing pads. Oil ducts are formed in each bearing pad for conducting oil from the inner face of the pad to its ends, and relatively cool oil under pressure is supplied to the ducts at the inner face of each pad. The ducts are angled and positioned to direct jets of cool oil against the thrust collar in the spaces between the ends of adjacent pads to reduce the temperature of the oil film which is carried by the thrust collar from one pad to another during rotation. A circular resilient O-ring seal bears against the inner face of each bearing pad and defines an oil chamber for receiving cool oil under pressure and for supplying the oil to the ducts at the inner face of the pad. A plurality of cap screws are threaded into the bearing retainer at spaced locations around the periphery of the retainer, the head of each cap screw being positioned in a corresponding space between two bearing pads and serving to limit the circumferential movement of the bearing pads. Each bearing pad has a pin extending adjacent to the head of a corresponding cap screw to prevent the cap screw from becoming inadvertently unthreaded and detached from the bearing retainer.

3,814,488
BEARING ASSEMBLY
William R. Rood, Muskegon, Mich., assignor to Keene Corporation, New York, N.Y.
Filed Mar. 26, 1973, Ser. No. 344,729
Int. Cl. F16c *19/04*
U.S. Cl. 308—227 3 Claims



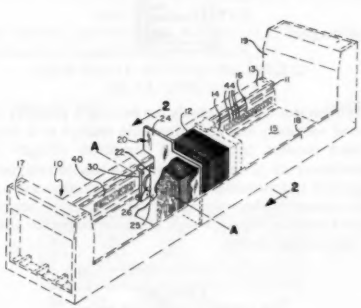
Bearing assemblies embodying annular inner and outer bearing races each having at least two grooved bearing paths, in which bearing means having rolling elements of the same diameter in opposed bearing paths of each of the inner and outer races providing for four-point contact with the inner surfaces of the bearing paths, and in which the grooved bearing paths of each race are parallel and concentric within a tolerance of about 0.001 inch per inch of diameter of said rollers.

3,814,489
INTERLOCKING COMPRESSION SUPPORT MEMBER
Harry L. Clark, Midland; Bertrand N. Trombley, Bloomfield Hills, and Clara V. Eicholtz, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Apr. 2, 1973, Ser. No. 347,238
Int. Cl. F16b *12/00*
U.S. Cl. 312—111 6 Claims



An interlocking compression support member having an elongated three sided body with integral fins or blades extending away from two sides and substantially parallel with the third side of the body. The support member may be used to secure a plurality of stacked modular units together, such as may be formed during construction of furniture, cabinets, display cases and the like.

3,814,490
FILE DRAWER FOLLOWER BLOCK
Carl J. Dean, Southbridge, and David M. Wright, Shrewsbury, both of Mass., assignors to Barry-Wright Corporation, Watertown, Mass.
Filed Oct. 12, 1972, Ser. No. 296,900
Int. Cl. B65d *1/24*
U.S. Cl. 312—183 4 Claims



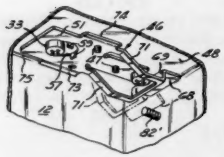
A file drawer is modified by the addition of a follower block which is inserted in the middle of a stack of cards, files, documents or other thin file pieces resting on edge in the drawer, and a longitudinal slide running along a tract and mounting the follower block on the slide via a pivotable hinge and providing pivoting limit stops for the follower block.

3,814,491

SNAP IN CONNECTOR

William Gene Kackley, Webster City, Iowa, assignor to Franklin Manufacturing Company, St. Cloud, Minn.

Filed Sept. 7, 1972, Ser. No. 286,878
Int. Cl. A47b 47/00
U.S. Cl. 312—257 R 10 Claims



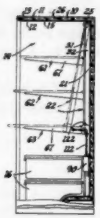
A connector arrangement for releasably joining a pair of members such as the component panels of a laundry appliance comprising grippers projecting from one component panel and elements on the other component panel adapted to cooperate with the grippers to resist forces between the components across the plane separating them. A self-engaging latch responsive to movement relative to one of the component panels is provided to automatically lock the panels together by preventing disengagement between the grippers and the cooperating elements and thereby complete the assembly of the panels with a minimum of effort. The latch includes a release tab which may be manually engaged by a suitable tool to permit separation of the panels.

3,814,492

CANTILEVER SHELF ASSEMBLY WITH PANTOGRAPHY SUPPORT ARRANGEMENT FOR REFRIGERATORS

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1972, Ser. No. 308,239
Int. Cl. A47b 88/00
U.S. Cl. 312—273 5 Claims



A refrigerator shelf assembly for moving a plurality of cantilevered vertically stacked adjustable shelves to a staggered extended position by a pair of composite stringer linkage mechanisms each pivotally supported in spaced relation to the refrigerator and movable in parallel vertical planes in a pantograph manner while maintaining the shelves in horizontally disposed relation, together with actuator means for automatically moving the shelves.

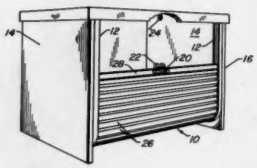
3,814,493

PLASTIC TAMBOUR DOOR

Arthur O. Radke, Milwaukee, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 24, 1972, Ser. No. 309,533
Int. Cl. E06b 9/14
U.S. Cl. 312—297 1 Claim

Tambour or roll up door is made by vacuum forming a heated thin plastic sheet into a form wherein the front face of the door comprises a series of relatively wide parallel face strips which are joined to each other by integral thin connecting portions having a generally U-shaped cross section. The relatively thicker face strip portions provide rigidity to the door and resist vibration while the thin interconnecting portions act as hinges to permit the door to be easily guided in a curved door track having a relatively small radius. The frictional resistance of the door to sliding in a curved track can be minimized by curving the connecting portions so that they provide a very small area of contact with the track. The front surface of the sheet is preferably patterned with alternating raised and depressed areas which not only provide a pleasing appearance but also reduce the surface contact area in contact with the guides.

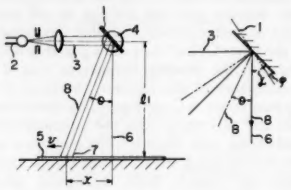


3,814,494

METHOD AND APPARATUS FOR OPTICALLY AND UNIFORMLY SCANNING A FLAT SURFACE

Yasuo Shiragai, and Takeshi Maeno, both of Odawara, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Claims priority, application Japan, Sept. 16, 1971, 46-71179
Filed Sept. 15, 1972, Ser. No. 289,262
Int. Cl. G02b 17/00
U.S. Cl. 350—6 5 Claims



A method and apparatus for uniformly scanning a flat surface of a paper sheet wherein the flat surface of the paper sheet is optically uniformly scanned using a light beam reflected by a rotating mirror non-uniformly rotated by means of a link mechanism or cam mechanism without curving the surface of the paper sheet or without effecting any electrical controlling.

3,814,495

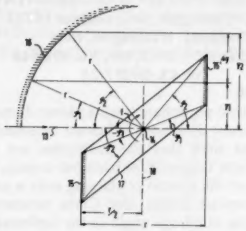
APPARATUS FOR PRODUCING A MOVING BEAM DISPLACED PARALLEL TO ITSELF

Arthur Walter, Denzlingen, Germany, assignor to Erwin Sick Optic-Electronik, Waldkirch, Germany

Filed Dec. 26, 1972, Ser. No. 318,620
Claims priority, application Germany, Dec. 24, 1971, 2164607
Int. Cl. G02b 17/00
U.S. Cl. 350—7 13 Claims

A scanning device with rotatable plane mirror surfaces movable about the radius of curvature of a cylindrical mirror

and positioned to pass through the focal plane of the cylindrical mirror. A light beam relayed from the movable plane mirror is reflected from the cylindrical mirror along a path parallel to the optical axis of the device for each successive position of the plane mirror.



3,814,496

BINOCULAR

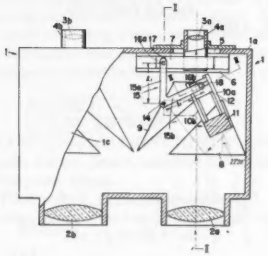
Shin Mukai, 2-5-5 Goutokugi, Setagaya-ku, Tokyo, Japan

Filed Apr. 11, 1973, Ser. No. 349,980

Claims priority, application Japan, Apr. 15, 1972, 47-37936

Int. Cl. G02b *7/12*

U.S. Cl. 350—75 **2 Claims**



A binocular wherein one of the eyepiece tubes is designed to move horizontally without requiring relative movement of the objective lenses so as to enable the user to adjust the interval between the eyepieces to the interval of his own eyes. Such construction of the binocular allows to utilize a rectangularly shaped field stop which is suitable to the visual angle of a human being's eyes, whereby clear and wide view can be obtained.

3,814,497

LIQUID CORE MULTIMODE OPTICAL WAVEGUIDE

Julian Stone, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 183,869, Sept. 27, 1971, abandoned. This application Nov. 24, 1972, Ser. No. 309,275

Int. Cl. G02b *5/16*

U.S. Cl. 350—96 WG **3 Claims**

Multimode optical waveguides have been fabricated using hollow fibers of either glass or fused quartz as the cladding and an organic liquid as the core. Transmission loss measurements with coherent light at 6328 A. and incoherent light at various wavelengths in the visible and near infrared have proven satisfactory and are comparable with those observed where the core material is a solid.

3,814,498

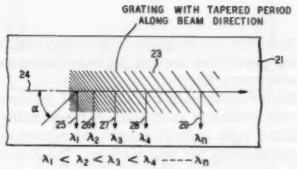
INTEGRATED OPTICAL CIRCUIT DEVICES EMPLOYING OPTICAL GRATINGS

Walter John Tomlinson, III, Holmdel, and Heinz Paul Weber, Middletown, both of N.J., assignors to Bell Telephone Labs, Murray Hill, N.J.

Continuation-in-part of Ser. No. 250,158, May 4, 1972, abandoned. This application Dec. 18, 1972, Ser. No. 316,096

Int. Cl. G02b *5/14, 5/18*

U.S. Cl. 350—96 WG **10 Claims**



There are disclosed a variety of new integrated devices for use at optical frequencies. Each of the devices comprises a body, either in the form of a cladded fiber or a thin-film dielectric waveguide, consisting of a low optical loss material suitable for guiding a beam of light and including an optical grating formed in the body so as to affect the propagation of the guided beam. By properly selecting the period, amplitude of modulation, angle and length of the grating, there are realized wavelength selective beamsplitters and beam combiners, broadband reflectors, and a variety of filters. Fabrication techniques and materials are also disclosed.

3,814,499

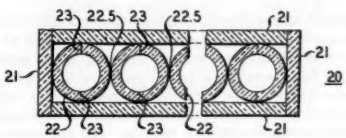
OPTICAL CABLE INCLUDING A PLURALITY OF SINGLE MATERIAL FIBERS

Enrique Alfredo Jose Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Murray Hill, N.J.

Filed May 11, 1973, Ser. No. 359,232

Int. Cl. G02b *5/16*

U.S. Cl. 350—96 WG **10 Claims**



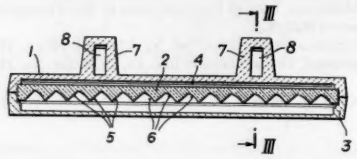
A plurality of hollow tubes of single-material optical fibers are closely packed together within an optical absorbing housing. The single-material neighborhood regions of tangency of mutually contacting pairs of tubes thereby form optical waveguides which support single mode optical transmission.

3,814,500

LIGHT REFLECTOR CONSTRUCTION FOR DETERRING GAME FROM CROSSING HIGHWAYS

Hubert Ebenbichler, Absam-Eichat, Tirol, Austria, assignor to D. Swarovski & Co., Tirol, Austria

Filed May 5, 1972, Ser. No. 254,773
Claims priority, application Austria, May 7, 1971, 3994/71
Int. Cl. G02b *5/12*
U.S. Cl. 350—97 **31 Claims**



A light reflector construction is disclosed which is suitable for deterring game from crossing highways when a motor vehicle approaches the reflector.

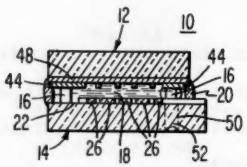
The reflector comprises a plurality of juxtaposed prisms with the cross section of each prism corresponding essentially to an isosceles, right angled triangle, the hypotenuse surfaces of the prisms forming the rear surfaces. The rear surfaces are capable of reflecting a light beam striking the prisms and at least one of the surfaces of each prism, when viewed in the cross section of the prism, being curved so as to scatter or diffuse reflected light. The rear surfaces of the prisms are either capable of total reflection and/or are provided with mirror layers.

3,814,501

LIQUID-CRYSTAL DISPLAY DEVICE AND METHOD OF MAKING

Henry Claude Schindler, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,773
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 LC **5 Claims**



Disposed on the inner surface of the rear substrate of the device are a plurality of rear electrodes, each made of a light-reflective electrically-conductive material, and a plurality of electrical leads extending therefrom. Directly opposite each rear electrode is an identically-shaped front electrode disposed on the inner surface of the front substrate and made of a transparent conductive material. The remainder of the inner surface of the front substrate is coated with a reflective conductive material. Preferably, the rear electrodes are formed by depositing aluminum or silver on positively-masked areas of the rear-substrate inner surface; and the front electrodes are formed by depositing a continuous coating of indium oxide or tin oxide on the front-substrate inner surface, and then depositing aluminum or silver on negatively-masked areas of the oxide coating.

3,814,502

HEAT TREATED FERROELASTIC ALPHA-LEAD STRONTIUM PHOSPHATE CRYSTALS HAVING CONTROLLED DOMAIN WALL ORIENTATION

John R. Barkley, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1972, Ser. No. 301,540
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 **3 Claims**

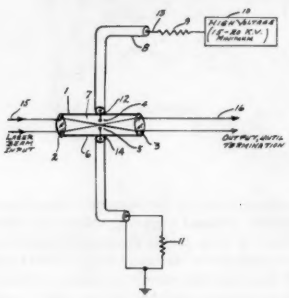
A crystal of *a*-lead phosphate having planar domain walls in at least two different directions is heated to establish a temperature gradient such that the isotherms are essentially planar and the Curie temperature isotherm crosses the crystal so that a region of the crystal containing only a single set of domain walls remains below the Curie temperature, the domain walls being at a large angle to the isotherm. On cooling so that the Curie point isotherm moves laterally through the plate, the domain walls extend behind the isotherm to cover the plate. Crystals so poled can be utilized in optical switches and line scanners wherein the crystal plate is switched from one strain state to another by lateral motion of the domain walls.

3,814,503

ULTRA-FAST TERMINATOR FOR INTENSE LASER PULSES

David Milam, Burlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 7, 1973, Ser. No. 330,366
Int. Cl. G02f *1/36*
U.S. Cl. 350—160 R **5 Claims**



An ultra-fast terminator for laser pulses is provided in which plasma produced by firing a laser-triggered spark gap is used to speed and enhance the formation of a highly opaque plasma across the focal plane of a laser beam. The additional plasma contributed by the spark gap serves to prevent leakage of the beam past the plasma created by the laser itself.

3,814,504

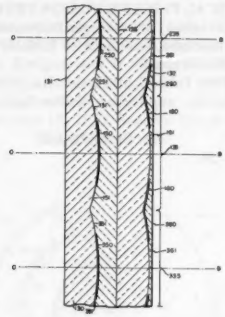
REFLECTING LENS ARRAY

John Francis Brady, Clifton, and William Augustus Grill, Lake Parsippany, both of N.J., assignors to Universal Technology Inc., Verona, N.J.

Filed Apr. 28, 1972, Ser. No. 248,725
Int. Cl. G02b *17/08, 27/00*
U.S. Cl. 350—167 **11 Claims**

A reflecting-type fly's eye lens array is described having extremely high resolution capabilities. By means of photoresist techniques, a first array of similar reflecting surfaces are formed on each of a first multitude of substantially identical curved surfaces of a transparent medium and a second array of similar reflecting surfaces are formed on each of a second

multitude of substantially identical curved surfaces of a transparent medium. The surfaces of the two multitudes are aligned with each other in one-to-one relationship so that each curved surface of the first multitude has a common optical axis with a corresponding curved surface of the second multitude. In addition, the reflecting surfaces of the first and second arrays are shaped in the characteristic ring and dot patterns of a Cas-



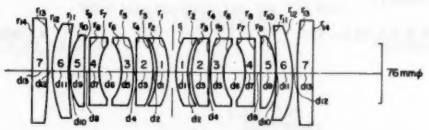
segrain or Gregorian lens; and the curvatures of the reflecting surfaces are selected such that electromagnetic radiation incident upon each ring-shaped reflective surface is reflected to the corresponding dot-shaped reflective surface. As a result, a multitude of small reflecting lenses are formed having an extremely high resolution that permits the fabrication by photoresist techniques of elements having submicron dimensions.

3,814,505

EQUI-MAGNIFICATION COPYING LENS

Kenichi Harada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo-to, Japan

Filed Sept. 7, 1972, Ser. No. 286,947
Claims priority, application Japan, Sept. 8, 1971, 46-68855
Int. Cl. G02b *9/64*
U.S. Cl. 350—214 **5 Claims**



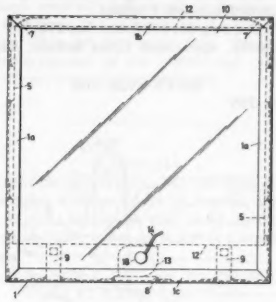
An equi-magnification lens system for copying is described. To obtain an equi-magnification lens, which can cover a wide effective field and is compact, and whose various aberrations are sufficiently corrected, according to the present invention there is provided a perfectly symmetric optical system consisting of two lens groups symmetric with respect to a stop. Each lens group consists of seven lenses successively arranged from the stop. The first lens nearest to the stop is a negative meniscus lens with the convex surface directed toward the stop. The second lens is a positive lens with its convex surface of a small radius of curvature directed toward the stop. The third lens is a negative meniscus lens with its convex surface directed toward the stop. The fourth lens is a negative meniscus lens with its concave surface directed toward the stop. The fifth lens is a positive lens with its convex surface of a small radius of curvature directed away from toward the stop. The sixth and seventh lenses are both positive lenses.

3,814,506

PANELS WITH AN OPTIONAL THROUGH-VISION FACILITY

Astor Andrew Steele, London, England, assignor to Steele's (Contractors) Limited, London, England

Filed Jan. 9, 1973, Ser. No. 322,103
Int. Cl. G02f *1/30*
U.S. Cl. 350—272 **13 Claims**



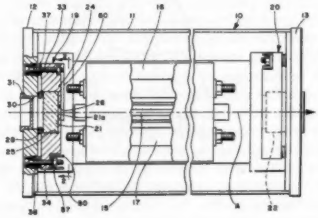
A panel with an optional through-vision facility comprising three sheets with transparent areas, the sheets being arranged as a superposed pair of outer sheets secured in a rigid frame with a third or centre sheet slidably sandwiched between the two said outer sheets, the centre sheet and one or both said outer sheets being marked with strips of at least reduced transparency whereby sliding movement of the centre sheet with respect to the outer sheets causes a variation in overall through-vision of the panel, the rigid frame of the panel being formed as a rectangle with a generally U-shaped channel cross-section and the sides of the rectangle having members disposed in the channel on the base of the U to space the outer sheets apart, cam means being operable on the centre sheet to move it slidably with respect to the two outer sheets.

3,814,507

ADJUSTABLE MIRROR MOUNT

Dale B. Osborn, Sunnyvale, and William R. Hill, Campbell, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Dec. 4, 1972, Ser. No. 311,887
Int. Cl. G02f *1/34*
U.S. Cl. 350—285 **6 Claims**



A mirror mounting plate is pivotally supported on a wall for independent movement in two perpendicular planes by two substantially identical coarse and fine adjustment mechanisms. Each adjustment mechansim comprises a coarse adjustment screw extending through the wall and mounting plate and adapted to vary the spacing therebetween when rotated. Fine or vernier adjustment is provided by pivoting one end of a lever about the screw adjacent to the plate by

means of a fine adjustment screw connected between the other end of the lever and the wall. Springs between the wall and mounting plate provide resilient support for the latter and an O-ring compressed between the wall and mirror seats the latter tightly within the mounting plate.

3,814,508

OPTICAL SYSTEMS

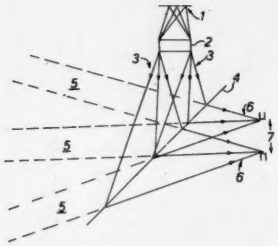
Michael Harold Freeman, Denbigh, Wales, assignor to Pilkington P.E. Limited, London, England

Filed July 31, 1972, Ser. No. 276,319

Claims priority, application Great Britain, Aug. 3, 1971, 36380/71

Int. Cl. G02b *5/08*

U.S. Cl. 350—299 **18 Claims**



This invention provides an optical system for displaying visual information. The system has a main plane towards which light is projected, and from which the light travels in a different direction. The system is comprised of reflecting surfaces which are provided in the region of the main plane. Each surface is orthogonal to the main plane and each of the surfaces is orthogonal to an adjacent surface. Thus incident light, by successive reflections, is directed away from the main plane in a direction exactly 180° opposite to that in which it would travel if a mirror were to be located in the main plane.

3,814,509

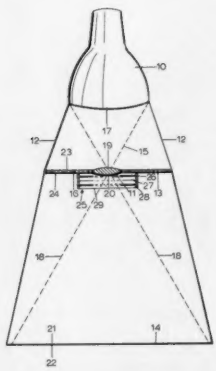
TELEVISION PICTURE PROJECTING DEVICE

Gene L. Miano, 446 W. 17th St., Erie, Pa. 16502

Filed Aug. 18, 1972, Ser. No. 281,639

Int. Cl. G02b *27/00*

U.S. Cl. 350—321 **3 Claims**



The present invention relates to a means for displaying a television picture on a large screen made of translucent material by means of a double convex lens located at its focal distance from the television picture and the screen located at a predetermined distance in front of the lens. The area between the television and the screen is enclosed by a black cloth or other black material. A partition made of pegboard is disposed between the screen and the television and the double convex lens is set in an opening in the partition.

3,814,510

METHOD AND APPARATUS FOR MEASURING THE CRITICAL FLICKER FUSION FREQUENCY

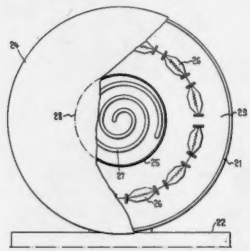
Karl Adler, Grenchen, and Georges Ducommun, Feldbrunnen, both of Switzerland, assignors to Biviator S.A., Grenchen, Solothurn, Switzerland

Filed Feb. 25, 1972, Ser. No. 229,492

Claims priority, application Switzerland, Mar. 5, 1971, 3226/71

Int. Cl. A61b *3/02*

U.S. Cl. 351—36 **12 Claims**



A method and apparatus for measuring the critical flicker fusion frequency of a person, wherein flickering light pulses are displayed for observation on an area surrounded by a ring-shaped area illuminated by an adaptation light appearing as a constant non-flickering light.

3,814,511

KINEMATOGRAPHIC PROJECTOR

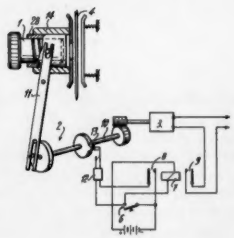
Serge Oulevay, Yverdon, Switzerland, assignor to Bolex International S.A., Sainte-Croix Vaud, Switzerland

Filed Feb. 17, 1972, Ser. No. 227,094

Claims priority, application Switzerland, Mar. 4, 1971, 3163/71

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **4 Claims**



The present invention has for its object an arrangement ensuring the fading of the film pictures during the passage from one sequence to another. This is obtained in a manner readily available for amateurs by means of a notch, adhesive or the like mark applied to the film just ahead of the line separating two successive sequences of the pictures. This reference mark controls mechanically or electrically means acting transiently

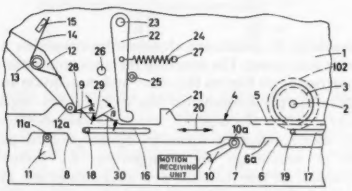
on the film illuminating beam, so as to subdue it through a decrease in luminosity or in sharpness of the pictures following the reference mark. To this end, the objective may be transiently unfocused or else a translucent screen may be caused to cut off the beam to a gradually increasing and then decreasing extent or again, the current feeding the illuminating bulb may be transiently reduced to dim the light accordingly.

3,814,512

OPERATING MEANS FOR MOTION PICTURES PROJECTORS OR THE LIKE

Herbert Reinsch, Kongen, and Wolfgang Riedel, Winnenden, both of Germany, assignors to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed June 15, 1972, Ser. No. 262,974
Int. Cl. G03b *1/00*
U.S. Cl. 352—178 **5 Claims**



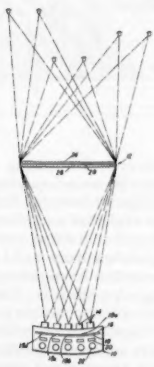
A motion picture projector wherein a rotary knob carries a pinion which meshes with the rack of a reciprocable slide having several longitudinally spaced cam faces which cooperate with pivotable levers. The levers serve to actuate various movable devices or units in the projector, such as the sound head, the loop former, a device for moving the film threading mechanism and others. At least one of the levers further serves as a stop for the slide and/or as part of detent means for yieldably holding the slide in one or more predetermined positions.

3,814,513

3-D SCREEN AND SYSTEM

Jerry Curtis Nims, Atlanta, Ga., and Allen Kwok Wah Lo, Kowloon, Hong Kong, assignors to Dimensional Development Corporation, Chamblee, Ga.

Filed July 24, 1972, Ser. No. 274,603
Int. Cl. G03b *21/00*
U.S. Cl. 353—7 **7 Claims**



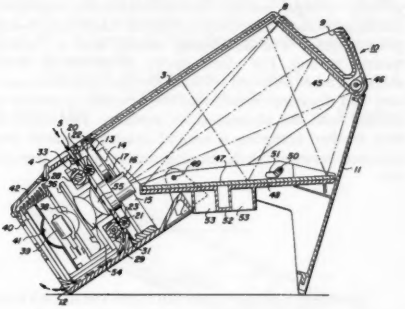
A lenticular composing screen focusses a number of two dimensional pictures each as a series of horizontally condensed and horizontally separated image strips and the image strips of the several pictures are uniformly spaced so that blank spaces normally would appear between them. A light diffusing screen receives these strips and a viewing screen allows observers to receive composite images of different pictures in the left and right eyes. The composing screen is vibrated harmonically so that each image strip is shifted from its normal position to a position filling the blank space to one side of it, the harmonic motion assuring that the two positions of each image strip are temporarily stationary while intermediate positions are swept so rapidly as to be undetected by the observer while, at the same time, the integrating or memory characteristics of the human eye retain the temporarily stationary images being observed.

3,814,514

MICROFORM PROJECTION AND VIEWER APPARATUS

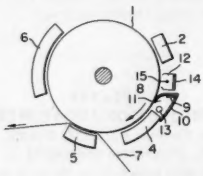
James R. Douglas, Covina; Lloyd M. Adams, Santa Ana; Edward G. Mycek, Monrovia, and David A. Grafton, Santa Monica, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 7, 1972, Ser. No. 286,648
Int. Cl. G03b *21/28, 21/30*
U.S. Cl. 353—78 **4 Claims**



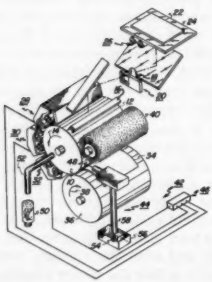
Apparatus for projecting and viewing microform images having a viewer housing including a viewing screen. A light source is supported therein for illuminating microform images on microform material. The light source is supported within a lamp housing and the lamp housing includes a plurality of fin members which extend externally outwardly therefrom to increase the heat transfer characteristics of the lamp housing. A light collecting reflector is supported within the lamp housing at one side thereof adjacent the light source and reflects radiation from the light source through an aperture in the lamp housing on the side opposite the collecting reflector along a first optical path. A condensing lens assembly along the first optical path illuminates microform images at a projection station and a projection lens assembly also along the first optical path projects the illuminated images onto a first reflecting member. The first reflecting member reflects the projected images along a second optical path onto a second reflective member which in turn reflects the projected images along a third optical path and onto the viewing screen. A carriage member is supported within the viewer housing and is adapted to receive a microform member. The carriage member provides a transportation arrangement for transporting the microform member in predetermined directions relative to the optical path and the projection station which directions are substantially mutually perpendicular. A guide arrangement is also provided for guiding a microform member from within the viewer housing for removal therefrom.

3,814,515
SCATTERED TONER SHIELD DEVICE IN ELECTROPHOTOGRAPHIC COPYING MACHINE
Torr Takahashi; Hidejiro Kadowaki, both of Tokyo, and Tsukasa Kuge, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 17, 1972, Ser. No. 281,414
Claims priority, application Japan, Aug. 27, 1971, 46-65677
Int. Cl. G03g 15/08
U.S. Cl. 355—3 DD 2 Claims



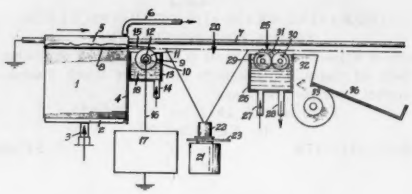
A scattered toner shield device in an electrophotographic copying machine which includes a photosensitive medium having a dielectric surface layer and a photoconductive layer, primary charger means, contemporaneous exposure and discharge means, a developing station comprising overall exposure means and developing means, and if required, a transfer station. The shield device comprises an insulative shield member disposed between the contemporaneous exposure and discharge means and the developing station and in contact with the photosensitive medium. The shield device may further comprise a second insulative shield member disposed between the developing station and the transfer station.

3,814,516
HUMIDITY COMPENSATED CONTROL DEVICE
Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 7, 1973, Ser. No. 357,764
Int. Cl. G03g 15/08
U.S. Cl. 355—3 DD 10 Claims



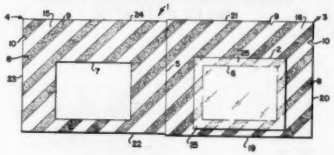
A humidity compensated control device in which the dispensing of particles from a particle storage container to a mix is regulated for maintaining the developability of the mix at a substantially optimum level.

3,814,517
ELECTROSTATIC COPIER
Alan James Brock, North Adelaide, Australia, assignor to Repco Research Pty. Ltd., Dandenong, Victoria, Australia
Division of Ser. No. 245,206, April 18, 1972. This application May 30, 1973, Ser. No. 365,127
Int. Cl. G03g 15/00
U.S. Cl. 355—3 R 3 Claims



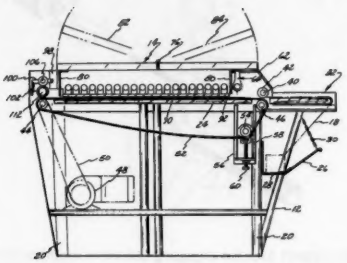
A machine for producing electrostatic images on a pre-cut or continuous sheet. The machine includes apparatus to apply a photoconductor film to the sheet and in addition to apply a charge to the photoconductor film on the sheet, apparatus to produce a latent electrostatic image on the photoconductor film by electromagnetic waves by discharging the photoconductor in non-image areas, apparatus for removing the photoconductor film from the non-image areas and, apparatus to fix the remaining portions of the photoconductor film to the sheet to produce a visible image. The apparatus to apply the photoconductor film to the sheet and charge the same comprises an applicator roller which dips into a tank containing the photoconductor medium. The applicator roller has a conductive core and a semi-conductor covering. Corona-forming voltage is supplied to the core and applied between the core and a conductive backing member which carries the sheet.

3,814,518
FILM-MOUNT ASSEMBLY
Robert A. Wichers, 527 Roosevelt Ave., Beloit, Kans. 67420
Filed Feb. 20, 1973, Ser. No. 334,098
Int. Cl. G03b 27/62
U.S. Cl. 355—75 1 Claim



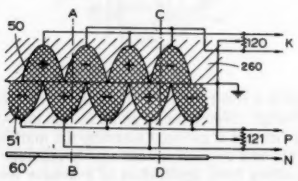
A film-mount assembly for holding translucent material, such as a color negative or transparency from which color prints are to be produced includes first and second sheets preferably joined at a fold line and positioned in overlying or facing relation with each of the first and second sheets having a light-transmitting window therein and substantially in registry with a translucent film or negative extending across the windows and having edge portions of the film or negative in engagement with facing surfaces of the first and second sheets. Peripheral edges of the sheets have notches therein to be used to position the sheets to receive the film and a pair of apertures are positioned adjacent one edge of the sheets and adapted to receive therein register pins to thereby position the assembly and the film therein in a selected position for making a plurality of successive prints therefrom.

3,814,519
PHOTOGRAPHIC EXPOSURE APPARATUS
Barthel Zeunen, Clarkston; Rex C. Grace, Troy, and Alvie R. Dunn, Madison Heights, all of Mich., assignors to Capitol Reproductions Inc., Madison Heights, Mich.
Filed Dec. 29, 1971, Ser. No. 213,398
Int. Cl. G03b 27/10
U.S. Cl. 355—103 6 Claims



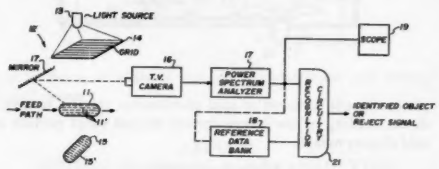
A portable photographic exposure apparatus for making reproductions of loft drawings, body drafts or the like in which a film and drawing are fed simultaneously into the exposure area. The apparatus includes a wheeled cabinet structure, which may include an internal supply of film, and an exposure unit secured to the cabinet and including a source of light and a source of static electricity. Static electricity is used to press the film and drawing together and smooth the drawing against the film for dimensional accuracy of the reproduction and to eliminate air bubbles. The exposed film and drawing may be separated and the film fed to a developer which may be attached to or positioned adjacent the cabinet structure.

3,814,520
METHOD OF, AND APPARATUS FOR GAUGING, INSPECTING OR MEASURING PHYSICAL PROPERTIES OF OBJECTS
Lionel Richard Baker, Orpington; Barry John Biddles, Sidcup, and Thomas Llewellyn Williams, Chislehurst, all of England, assignors to Sira Institute, Chislehurst, Kent, England
Filed May 28, 1971, Ser. No. 148,104
Int. Cl. G06k 9/08; G01b 11/00
U.S. Cl. 356—71 32 Claims



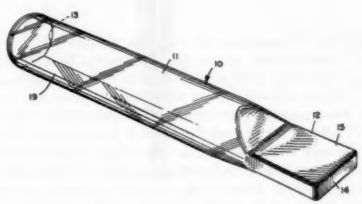
An apparatus for gauging inspecting or measuring properties of objects and employing a detecting device receiving light from an image of the object which light is influenced in accordance with the property under investigation. The detecting device has an array of photo-electric elements or sensors which are separated by the use of masks or other means into two units each exhibiting a sinusoidal variation in sensitivity to the light received along a particular direction. The sinusoidal variations of the units are mutually displaced by 90 electrical degrees so that the device can produce electrical signals corresponding to the real and imaginary parts of a Fourier transform of the distribution of intensity of light in the image. These signals are processed to extract information about the property under investigation.

3,814,521
OBJECT RECOGNITION
John Marshall Free, Montclair, N.J., assignor to Hoffmann-LaRoche Inc., Nutley, N.J.
Filed Sept. 12, 1972, Ser. No. 288,464
Int. Cl. G01b 11/00
U.S. Cl. 356—156 7 Claims



An optical apparatus and method for recognition of three-dimensional objects comprising an uneven illumination to project a striated pattern of illuminated and non-illuminated areas on the object which is scanned along a plurality of successive scan lines for generating video data which is compared with reference data for object recognition purposes.

3,814,522
SPECIMEN TUBE FOR MICROSCOPIC EXAMINATION
John A. Clark, Fort Lauderdale, and Warren A. Wells, Miami, both of Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Feb. 28, 1973, Ser. No. 336,511
Int. Cl. G01n 21/24, 1/10
U.S. Cl. 356—197 9 Claims



A tube and method particularly useful in urinalysis and other analytical procedures in which the sediment in a sample of body fluid is subjected to microscopic examination. The tube is transparent, open at its upper end, and suitable for use in a centrifuge. The closed lower end of the tube is flattened to define a reduced chamber portion for retaining only a thin layer of sample, thereby permitting microscopic examination of the sediment within the flattened portion. The main body portion of the tube is provided with a flat surface extending along a plane parallel with the tube's flattened lower end portion.

3,814,523
PHOTO-ELECTRIC DENSITOMETER
Toshio Abe, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 101,065, Dec. 23, 1970, abandoned.
This application July 7, 1972, Ser. No. 269,559
Int. Cl. G01n 21/48
U.S. Cl. 356—202 1 Claim

An improved portable type of photo-electric densitometer, which contains a photometer section as well as display means within its main body, and in which one of the legs of the main body is provided with a light inlet opening which functions, when said densitometer is placed on a sheet carrying an image

thereon, as an optical path for leading the light transmitted through the sheet portion beneath said particular one leg to a

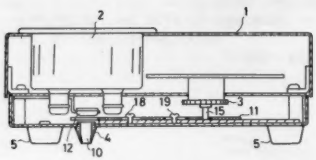


photo-electric element in said photometer section to give a direct reading of the image density at said sheet portion on said display means.

3,814,524
MECHANICAL PENCIL

Vincent R. Sperti, 3718 Valley Hill Dr., Randallstown, Md. 21133

Filed May 15, 1973, Ser. No. 360,444
Int. Cl. B43k *27/20, 24/08*
U.S. Cl. 401—57 **41 Claims**

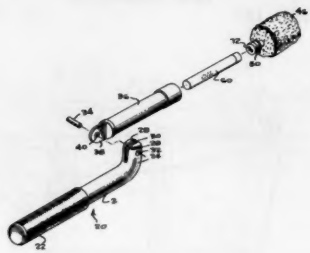
A mechanical pencil having an axial pushbutton for depressing light and heavy series-mounted compression springs to move the writing lead to any one of three preselectable cam-set positions: (a) retracted, (b) extended for writing, and (c) further extended to feed more lead; successive depressions of the light spring extend and retract the lead; depressing the light spring and continuing through with further pressure depressing the heavy spring (longer stroke) moves the mechanism to the lead feed position; the lead is always returned to the extended or writing position after lead feed by action of coaxial cylindrical sleeve camway and cam follower arrangements comprising two-island and series related single-island camway patterns in various embodiments.

3,814,525
FIREARM CHAMBER LUBRICATING AND CLEANING DEVICE

Louis L. Spencer, 293 W. State. St., Pleasantville, Pa. 16341

Filed Jan. 19, 1973, Ser. No. 325,219
Int. Cl. F41c *31/02*
U.S. Cl. 401—190 **13 Claims**

Chamber cleaning means for a shotgun is disclosed including a swab pivotally connected by a pivot pin to the end of a relatively short offset arm extending transversely from one end of a handle member so that the swab can be moved into the shell chamber for lubricating and cleaning purposes; another aspect of the invention resides in the provision of a hollow chamber in the offset arm containing a cartridge of cleaning/lubricating fluid under pressure with the cartridge having a ball valve at one end adjacent the swab, the swab is mounted on a swab supporting stud shaft movable into the end

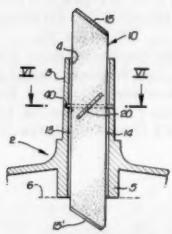


of the support arm for engaging the valve member to open the valve and permit lubricating fluid to flow along an axial passageway in the stub shaft and thence outwardly through radial openings into the swab; in another embodiment of the invention, the cleaning/lubricating liquid is sprayed outwardly against one end of the swab member.

3,814,526
SABOTAGE-PROOF MARKING INSTRUMENTS AND ELEMENTS THEREFOR

Lotfi H. Lotfallah, Hollywood, Calif., assignor to The Gillette Company, Santa Monica, Calif.

Filed Sept. 13, 1971, Ser. No. 179,771
Int. Cl. B43k *5/00*
U.S. Cl. 401—199 **7 Claims**



Relates to a construction of marking instruments (including a reservoir for colored liquid and a frontal portion in which a marking element is carried) whereby the marking element is firmly held and the instrument resists sabotage and impairment resulting from application of excessive force axially to the exposed end of the marking element. Provides marking elements in carrying means for anchoring them in marking instruments to resist displacement without deleterious changes in operating characteristics.

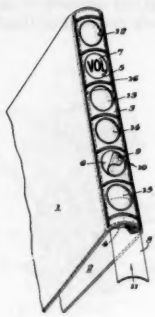
3,814,527
LOOSE LEAF BINDERS

Michael John Anthony Lawes, 11 Jew St., Brighton, Sussex, England

Filed June 8, 1972, Ser. No. 261,005
Int. Cl. B42f *21/02*
U.S. Cl. 402—3 **13 Claims**

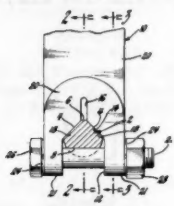
A loose leaf binder is provided which incorporates two covers hingedly connected to an outer curved spine and a flat inner spine by means of peripheral welds. Paper retaining

means are provided on the inner spine and at least one portion of the outer spine is removable to form a window through



which a label inserted between the outer and inner spines is visible. The removable portion is defined by line welds produced during production of the peripheral welds.

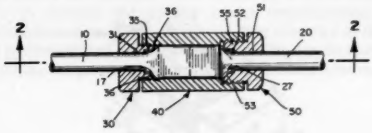
3,814,528
SHAFT AND ARM ASSEMBLY
Morris J. Duer, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 5, 1972, Ser. No. 286,317
Int. Cl. F16d *1/03*
U.S. Cl. 403—256 **1 Claim**



A shaft and arm assembly comprising a shaft with two flats forming a convex angle and a transverse groove on the side of the shaft opposite the apex of the angle, an arm formed from a strip of material bent back on itself to form two parallel members and a curved end with an opening that extends into each member as a notch and a slot, the sides of the notch fitting against the flats of the shaft, a bolt extending inside the bent end of the arm along the groove in the shaft and a nut on the bolt which, when tightened, causes the sides of the notches to be pinched together against the flats to draw themselves and the bolt tightly into fixed angular position against the shaft.

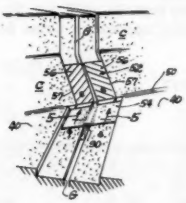
3,814,529
COUPLING MEANS FOR SEWER ROD
Charles B. Caperton, 52 Pitney Ave., Springlake, N.J. 07762
Filed Mar. 1, 1973, Ser. No. 336,928
Int. Cl. F16b *7/18*
U.S. Cl. 403—393 **3 Claims**

Coupling means connect short individual sections of steel rod into a long continuous length of rod for clearing obstructions in underground pipe, sewers and other conduits and provides transmission of applied axial and torque forces from one



rod to the next without slippage therebetween and without loss of power.

3,814,530
METHOD OF SEALING A CURB AND GUTTER ROADWAY GAP AND SEALING ASSEMBLY THEREFOR
Clarence H. Neff, Skokie, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.
Filed Feb. 18, 1972, Ser. No. 227,410
Int. Cl. E01c *11/02, 11/12*
U.S. Cl. 404—67 **20 Claims**

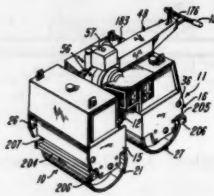


An improved sealing assembly for sealing the curb and gutter portions of a roadway gap at the intersection of adjacent roadway slabs. The sealing assembly includes a curb face piece assembly providing an elastic, flexible sealing flap spanning the intersection of the curb and gutter portions, and which is sealingly joined to the curb face piece assembly and to a complementary gutter gap sealing member. The sealing flap is conformed to portions of the curb face piece assembly and gutter gap sealing member, particularly in their regions overlying the curb and gutter gap portions. Desirably those regions comprise flexible joint membranes. A shaping member disposed in the gap, and extending upwardly therefrom, shapes the flap to assist in conforming it to those regions. The curb face piece assembly is affixed to the curb portions of the slabs adjacent the gap, the flap is conformed to the shaping member and the gutter gap sealing member is positioned over and conformed to the shaped flap. Suitable adhesive or mastic material seals the several members in a water-tight relationship and in a relationship resistant to separation due to forces encountered in dynamic loading of the adjacent roadway slabs.

3,814,531
ARTICULATED ROLLER ASSEMBLY
John T. Carnahan, and Eugene C. Briggs, both of Dayton, Ohio, assignors to Koehring Company, Milwaukee, Wis.
Filed Dec. 13, 1971, Ser. No. 207,185
Int. Cl. E01c *19/28*
U.S. Cl. 404—117 **24 Claims**

An earth compacting machine utilizing in-line vibratory roller drums, each associated with a respective frame section and the frame sections being joined together by an articulated coupling. Vibratory means is disposed in individual drums. Hydraulic means under the control of a riding or walking operator powers the vibratory means, effects either forward or

reverse traversal of the machine by positively rotating the roller drums, and enables steering by a powered angular movement of one of the roller drums. A novel steering system

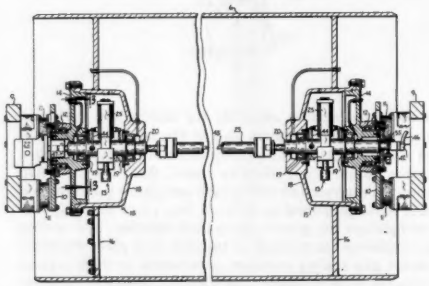


of general application amplifies steering input signals and incorporates a simplified follow-up mechanism to assure accurate, sensitive response to such signals.

3,814,532
COMPACTING MACHINE HAVING VARIABLE VIBRATION

John C. Barrett, and Roger L. Larson, both of Minneapolis, Minn., assignors to Raygo, Inc., Minneapolis, Minn.

Filed Sept. 20, 1972, Ser. No. 290,531
Claims priority, application Great Britain, Feb. 4, 1972, 5335/72
Int. Cl. E01c *19/28*
U.S. Cl. 404—117 **5 Claims**



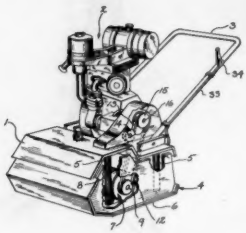
A rotatably driven eccentric carrier has its axis parallel to that of a compacting machine drum. A large eccentric mass fixed to one side of the carrier is only partially counterbalanced by a smaller radially movable mass thereon; hence centrifugally responsive movement of the smaller mass decreases vibration amplitude. The radial position of the smaller mass is controlled by a single-acting hydraulic jack on the carrier, connected with an accumulator through a manually operable valve. Speed of carrier rotation is controllable. A pressure responsive cutout switch in the jack-accumulator circuit prevents overspeed.

3,814,533
COMPACTOR FOR SOIL AND THE LIKE WITH IMPROVED VIBRATOR ASSEMBLY

Herman R. Buck, Rt. 2, Hartford, Wis. 53027

Filed Nov. 3, 1972, Ser. No. 303,508
Int. Cl. E01c *19/34*
U.S. Cl. 404—133 **11 Claims**

A compactor for soil and the like includes a pair of concentric weights which are disposed to rotate about the same axis and with the weights being disposed concentrically on different radii with respect to the axis. More specifically, one eccentric weight and an associated bevel gear are fixedly mounted to the drive shaft which defines the said axis, while the other weight and its associated bevel gear are freely rotatable thereon. The bevel gears are connected by a pinion which is mounted on a shift ring disposed on one side of the weights, which in turn is freely mounted on the drive shaft and freely



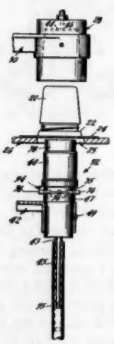
rotatable within the vibrator housing. A differential drive means is thus provided.

Means are provided to hold the shift ring in the desired position, and to permit rotation of the ring when a different angle of force is desired. In one embodiment, a locking pin selectively engages abutments on the ring. In another embodiment, an adjustable cable holds the ring in position.

3,814,534
APPARATUS FOR TRIMMING AND FINISHING PLASTIC JARS

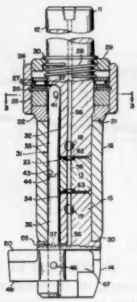
Robert Lee Humphreys, St. Charles, and James Edward Spitzer, North Aurora, both of Ill., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 176,151, Aug. 30, 1971, Pat. No. 3,765,785. This application June 4, 1973, Ser. No. 366,344
Int. Cl. B23b *51/08;* **B23c** *3/12*
U.S. Cl. 408—26 **6 Claims**



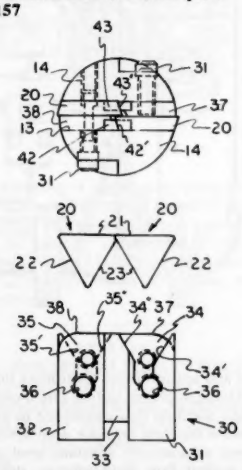
Method and apparatus for trimming and finishing in one operation plastic jars produced with a flange extending from the mouth thereof. A revolving cutter blade enters the mouth of the jar, and as the blade advances it cuts the flange from the jar. When the blade has cut the jar to the desired length, a gauge stop the blade's advance allowing it to finish the sealing surface of the air. The stringy scrap is guided into stationary chip breakers which reduce the scrap into smaller pieces.

3,814,535
BACK SPOTFACING AND COUNTERBORING TOOL
Rudolph Steiner, Fairport, N.Y., assignor to Numertap, Inc., East Rochester, N.Y.
Filed Feb. 7, 1973, Ser. No. 330,304
Int. Cl. B23b 51/00
U.S. Cl. 408—73 15 Claims



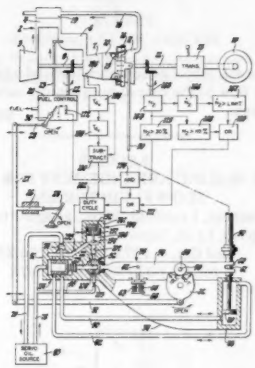
A spotfacing cutter is pivotal into and out of a recess in a tool shank by a hinge pin which is journaled in the shank. An activating ring, which is mounted for limited rotation on the shank, is connected with the hinge pin. An annular friction pad is interposed between the activating ring and a pilot sleeve which surrounds the shank. A braking surface is formed on the pilot sleeve or friction pad to be urged into engagement with the bore of a workpiece to brake the rotation of the activating ring relative to the shank so that the cutter will be moved to cutting position or retracted therefrom merely by simultaneously reversing rotation of the shank and braking the activating ring. The cutter can be passed through a bore of a workpiece while it is retracted; and the shank can then be reversed to extend the cutter into cutting position so as to back spotface the bore. Then the spindle can be reversed again, and the tool can be withdrawn through the bore.

3,814,536
BORING BAR
Paul A. Garrett, Box 462, Cowpens, S.C. 29330
Filed Sept. 27, 1972, Ser. No. 292,815
Int. Cl. B23b 29/034; B23q 3/00
U.S. Cl. 408—157 10 Claims



A boring tool is disclosed and claimed herein that utilizes indexible and replaceable polygonal cutting inserts. The inserts are preferably triangular and are received in a slot in the forward, cutting end of a tool. A mounting plate is secured within the slot and provides rigidity for the cutting inserts. Adjustment means are provided which cooperate with the mounting plate to position the cutting inserts simultaneously at a predetermined position to set the cutting diameter of the tool at a predetermined amount. Cutting inserts are thus adjusted to provide the proper diameter cut with removal from the tool.

3,814,537
TURBINE NOZZLE CONTROL
Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Company, Detroit, Mich.
Filed Sept. 22, 1972, Ser. No. 291,213
Int. Cl. F01b 25/06
U.S. Cl. 415—36 8 Claims

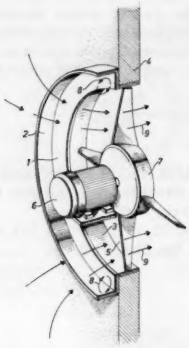


A gas turbine engine of the gas-coupled type has a variable nozzle for the power turbine. The nozzle vane angle is controlled by a servo system which provides power actuation of the vanes and which responds to a primary input of power demand to establish a normal steady-state blade angle curve as a function of engine power output. The system opens the nozzle to an accelearation position in response to acceleration of the engine and also further opens the nozzle to a reverse or braking position in response either to movement of the power control to idle with the power turbine above a minimum speed level or to excessive speed or acceleration of the power turbine. The servo system includes a primary control valve and a slave valve and means including a duty cycle controlled solenoid valve to override the normal blade angle control curve and provide the inputs for acceleration and braking. The primary control valve embodies a pintle laterally shiftable in a cylinder to differentially throttle two orifices to establish a variable control pressure to operate the slave valve.

3,814,538
AIR INLET THROAT FOR FANS
Lennart S. G. Sjoqvist, Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Aug. 21, 1972, Ser. No. 282,176
Int. Cl. F01d 9/02
U.S. Cl. 415—182 4 Claims

A frame for the inlet of a fan having a fan wheel of either the axial flow or radial flow type, wherein the frame comprises an outer hollow cylindrical ring facing the inlet, an inner ring of smaller diameter facing the fan wheel and an abrupt transition between the rings provided by an annular flange. The ratio of

the diameters of the inner and outer rings is within a critical range and is related to the length of the rings so that the air

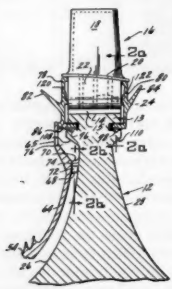


flow into the fan wheel generates a toroidal whirling and tumbling of the flow in the corner between the outer ring and the annular flange.

3,814,539
ROTOR SEALING ARRANGEMENT FOR AN AXIAL FLOW FLUID TURBINE

Nicholas Klompas, Lynnfield, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Oct. 4, 1972, Ser. No. 294,852
Int. Cl. F02d *5/08;* **F01d** *5/18*
U.S. Cl. 416—95 **10 Claims**



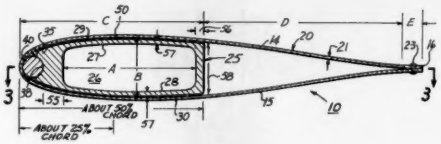
A sealing arrangement around the periphery of a turbine rotor disc includes a seal ring with an integral circumferential flange extending axially therefrom for insertion within an axial groove around the rotor disc wherein locking engagement between the flange and groove is provided by insertion of a shear wire between the flange and groove.

3,814,540
HELICOPTER ROTOR BLADE

Buford J. Schramm, 14805 S. Interstate 10, Tempe, Ariz. 85281, and Robert G. Everts, Tempe, Ariz.

Filed Jan. 27, 1972, Ser. No. 221,370
Int. Cl. B64c *27/46*
U.S. Cl. 416—226 **1 Claim**

A helicopter rotor blade having a simple and economical construction which includes internal counterweight means to shift the center of gravity to a forward location. A skin is wrapped around a former which has opposed top and bottom surfaces. The former cradles the counterweight member at the leading edge of the blade. The specific gravity of the counterweight member is greater than that of the former, and the trailing edges of the skin are joined together to close out the

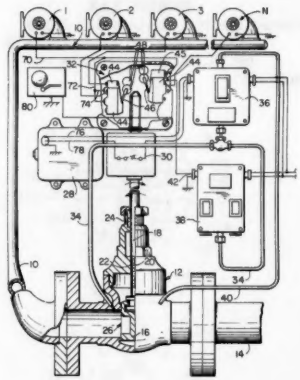


blade. The skin may be attached to the former by conventional shanked fasteners, or by resilient bonding means. The counterweight member may be pinned to the former to hold the blade together in the unlikely event of its fatigue failure.

3,814,541
FLUID SUPPLY APPARATUS

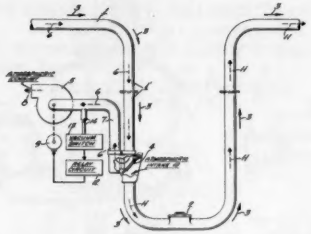
William Barron Dent, and Allan Jenner-Clarke, both of Surrey, England, assignors to Delta-Controls Limited, Surrey, England

Filed Nov. 24, 1971, Ser. No. 201,835
Int. Cl. F04b *41/06*
U.S. Cl. 417—7 **11 Claims**



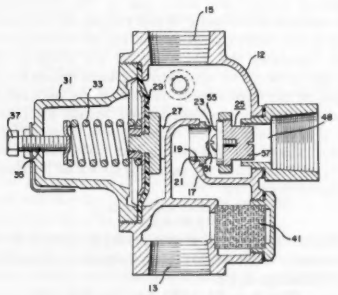
A method and apparatus for controlling fluid supplied to a delivery conduit comprising setting a fluid control valve in accordance with the fluid flow demanded by the delivery conduit to maintain the fluid pressure drop across the valve at a predetermined substantially constant level and activating a number of limited flow fluid sources, determined by the setting of the valve and sufficient to deliver the demanded flow to the delivery conduit.

3,814,542
AUTOMATIC PUMP SHUTDOWN CIRCUIT
Edmundo J. Iglesias, Lindwood, and Robert Mayer, Ardmore, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Filed June 30, 1972, Ser. No. 267,769
Int. Cl. F04b *49/00*
U.S. Cl. 417—12 **4 Claims**



In response to a sustained drop in the vacuum in a pneumatic line, a circuit automatically shuts down the vacuum pump (which is coupled to the line) for a short interval, and then restarts the pump.

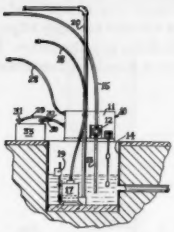
3,814,543
PUMP SYSTEMS FOR LIQUIDS
Darrell D. Gritz, Little Rock, Ark., assignor to Jacuzzi Bros. Incorporated, Little Rock, Ark.
Filed Jan. 30, 1973, Ser. No. 327,955
Int. Cl. F04b *49/08*
U.S. Cl. 417—26 **4 Claims**



A system for pumping of liquid under pressure, in which a pressure switch is adapted to control the starting and stopping of the pump within a safe pressure range, and in the event of malfunction of the pressure switch, the serviceline and associated plumbing is isolated from the pump to protect against development of pressures in the serviceline which might damage the plumbing.

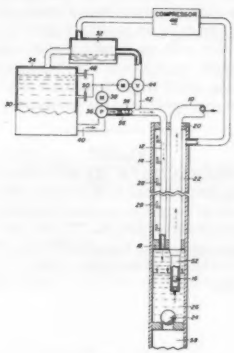
3,814,544
BATTERY-POWERED AUXILIARY SUMP PUMP
Richard J. Roberts, and Eduard F. Kamberg, both of Deerfield, Ill., assignors to Aqua-Not, Inc., Highland Park, Ill.
Filed June 15, 1972, Ser. No. 262,965
Int. Cl. F04b *49/04*
U.S. Cl. 417—40 **1 Claim**

A self-contained auxiliary sump pump battery-powered in response to a float switch, including an electrical battery charger for maintaining the battery in condition to operate the pump and having a battery condition indicator, a charger



operating light, a manual test switch for actuating the sump pump, and a timer unit for automatically operating the unit through a test cycle.

3,814,545
HYDROGAS LIFT SYSTEM
William Eugene Waters, Apartado 232, Maracaibo, Venezuela
Filed Jan. 19, 1973, Ser. No. 325,028
Int. Cl. F04f *11/00, 1/20*
U.S. Cl. 417—90 **3 Claims**

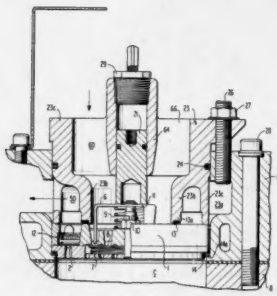


A power fluid is pumped downwardly through a power fluid tube toward the bottom of a well. The power fluid, due to pressure placed on the power oil fluid by a surface pump, forces the production fluid through a check valve and upwardly through a production fluid tube to the surface of the wall. Compressed gas is used to withdraw the power fluid from the power fluid tube so that the production fluid may again rise to the level of the production fluid tube and the pumping cycle is thereafter repeated. The power oil may also be removed by swabbing, rod pump, rotary pump, or any other form of artificial lift which may be applicable to the well.

3,814,546
SEAL ASSEMBLY FOR AIR COMPRESSOR VALVE
Richard Ostwald, Bowling Green, Ky., assignor to Gordon Smith & Co., Inc., Bowling Green, Ky.
Filed May 24, 1972, Ser. No. 256,604
Int. Cl. F04b *49/00*
U.S. Cl. 417—298 **8 Claims**

For air compressor valves, a seal assembly including a first seal ring between the valve body and a seat in the compressor head, a second seal ring concentrically positioned inwardly of the first seal ring and on the upper side of the valve body to which it is secured by a valve cage mounted in a passage in the

compressor head. The second seal ring is constructed to have a greater range of deformation or compression such that when the first seal is fully secured by movement of the valve cage into the compressor head, the second seal will not be compressed to its limit but will also sealingly engage the valve body without deforming or distorting the latter. The assembly includes a third seal which may be a conventional O ring positioned about the valve cage in sealing engagement with the compressor head. Preferably, the first and second seal rings are made from a combination of metallic and asbestos materials; the first seal ring being an annular copper ring having a U-shaped cross section with an annular ring of asbestos secured in the channel of the copper ring, and the second seal ring including alternating spiral rings of stainless steel and asbestos having a serrated or serpentine cross section.



3,814,547

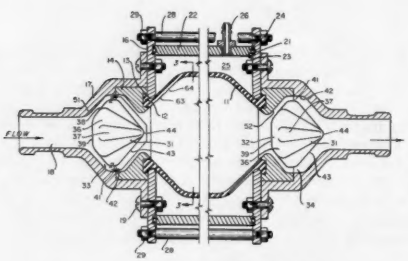
NONTRAUMATIC HEART PUMP

Sotiris Kitrilakis, and Thomas C. Robinson, both of Berkeley, Calif., assignors to Tecna Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 77,291, Oct. 1, 1970, abandoned. This application Sept. 2, 1971, Ser. No. 177,264

Int. Cl. F04b *35/02, 21/06*

U.S. Cl. 417—383 **10 Claims**



A blood pump including a pumping chamber provided with in-flow and out-flow valves substantially aligned with the axis of the pumping chamber. The valves are especially designed to eliminate protrusions which may act as sites of possible thrombus formation, to minimize turbulence and areas of stasis and to provide a smooth flow of blood past the valve and through the pumping chamber. The inner lining of the pump includes a surface which contains microcavities to facilitate the attachment of fibrin and cellular deposits to provide a pseudointimal lining compatible with blood.

3,814,548

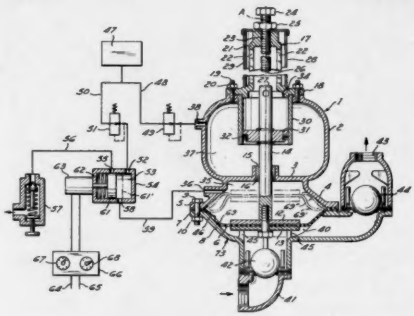
DIAPHRAGM PUMP APPARATUS

Warren E. Rupp, Mansfield, Ohio, assignor to The Warren Rupp Company, Mansfield, Ohio

Filed Aug. 5, 1971, Ser. No. 169,292

Int. Cl. F04b *43/06*

U.S. Cl. 417—395 **15 Claims**



Pump apparatus having a reciprocable diaphragm for delivering a highly accurate amount of pumped fluid per diaphragm pumping stroke. The amount of fluid pumped over a time interval may be accurately varied by adjusting the frequency or duration of the diaphragm stroke, or by adjusting the length of the stroke or by both measures. The diaphragm of the apparatus is moved in its pumping stroke by air applied to the rear side of the diaphragm, or the side opposite the front side contacted by the pumped fluid. Air pressure is always maintained on the rear side of the diaphragm to insure that the unsupported portion of the diaphragm between its outer supported edge portion and its central supported portion is at all times bowed toward the front side of the diaphragm; this prevents random positioning of this portion of the diaphragm in concave and convex positions during its stroking, and substantially increases the accuracy of the amount of fluid pumped per stroke. The apparatus includes means for varying the length of the stroke from outside of the apparatus. Also disclosed are solenoid actuated valve means for controlling the supply of air to move the diaphragm in its pumping stroke and timer means for controlling the solenoid so that the frequency or duration of the pumping stroke of the diaphragm can be varied as desired.

3,814,549

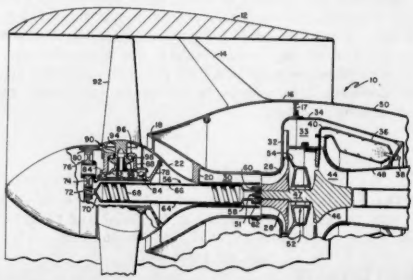
GAS TURBINE ENGINE WITH POWER SHAFT DAMPER

Val Cronstedt, Williamsport, Pa., assignor to Avco Corporation, Williamsport, Pa.

Filed Nov. 14, 1972, Ser. No. 306,443

Int. Cl. F04b *17/00*

U.S. Cl. 417—406 **6 Claims**



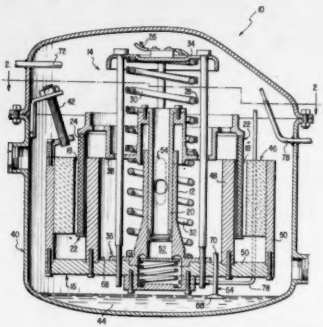
A gas turbine engine has an elongated thin wall, annular shaft extending from a rotor, including a turbine wheel to a

reduction gear assembly for a variable pitch fan. A cylindrical metallic spring is placed in the interior of the shaft and is forced against its inner wall by centrifugal force to dampen vibrations.

3,814,550
MOTOR ARRANGEMENT AND LUBRICATION SYSTEM FOR OSCILLATORY COMPRESSOR

Glen O. Adams, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 7, 1972, Ser. No. 313,154
Int. Cl. F04b *17/04*
U.S. Cl. 417—417 **7 Claims**



The production of an unbalanced, electrodynamic driving force to compensate for unbalanced compression forces in an oscillatory compressor is affected by a relative null positionment of the armature and air gap to locate an effective midplane of air gap flux density on the compression stroke side of a maximal plane of armature strength.

The substitution of permanent ceramic magnets for the usual metal alloy (Alnico) magnets not only results in substantial cost and weight savings but, also, permits a surrounding, concentric arrangement of the magnets and armature in widely spaced relation to the compression cylinder to preclude substantial heat transfer therebetween.

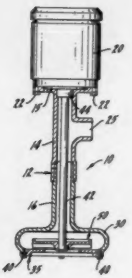
A vibrating tube pump, operative as a function of the reactive reciprocation of the compression cylinder and its interconnected casing, transfers lubricating oil upwardly from a lower housing reservoir to a compressor casing sump from whence the oil is distributed to the open, upper end of the compression cylinder to lubricate the same.

3,814,551
PUMP

Frank G. Weis, Kansas City, Mo., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Mar. 18, 1971, Ser. No. 125,667
Int. Cl. F04b *17/00*
U.S. Cl. 417—424 **11 Claims**

A small solids handling pump of the type for use in pumping mixed liquor or raw sewage, comprising: an elongated vertically extending hollow standard; a volute housing affixed to the lower portion of the standard having an inlet opening through a bottom portion thereof; motor means positioned above the upper end of the standard; an impeller positioned within the volute housing immediately above the inlet opening; and a shaft extending through the standard interconnecting the impeller to the motor means such that rotation of the impeller results in a vortex immediately below the inlet opening so as to centrifugally exclude large solids from entering the

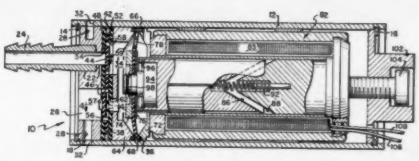


volute housing through the inlet opening. The diameter of the inlet opening is in the range of .4 to .7 times the diameter of the impeller.

3,814,552
PERSONAL AIR SAMPLING PUMP

S. Frederic Guggenheim, Teaneck, N.J., and Robert T. Graveson, Briarcliff Manor, N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 17, 1973, Ser. No. 351,894
Int. Cl. F04b *17/00*
U.S. Cl. 417—413 **4 Claims**



A lightweight, portable air pump employing a solenoid driven rubber diaphragm and rubber flapper check valves to control inlet and outlet flow. The diaphragm has a flexible annulus and a rigid central section so that there is virtually no accommodation to load, used with independently timed drive pulses for essentially constant flow with varying load.

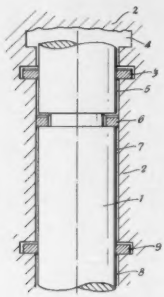
3,814,553
SEAL FOR A RECIPROCATORY BAR

Karl Wolfgang Hubschmann, Langweid, Germany, assignor to Motoren-Werke Mannheim AG, Mannheim, Germany

Filed May 11, 1972, Ser. No. 252,287
Claims priority, application Germany, May 11, 1971, 2123140
Int. Cl. F04b *21/02*
U.S. Cl. 417—511 **5 Claims**

A reciprocatory bar in a bore in a wall of a pressurized container has an annular peripheral groove receiving an annular non-return valve member allowing flow inwardly along the bore and forming part of a piston pump arrangement. The container wall has an annular peripheral groove opening into the bore and receiving an annular non-return valve member also allowing inward flow and forming part of the piston pump arrangement. An annular seal received in another annular peripheral groove in the container wall defines with the latter

valve member, the bar and the wall a relieving chamber of the arrangement, of which a pump chamber is defined by the two



valve members, the bar and the wall. On reciprocation of the bar, pressurized medium in the relieving chamber is returned to the interior of the container.

3,814,554

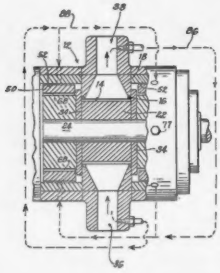
SUPPORT MEANS FOR ROTATING ELEMENTS

Birger F. Jansson, and Albert A. Schmitz, both of Racine, Wis., assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 27,722, April 13, 1970, abandoned. This application Apr. 14, 1972, Ser. No. 244,137

Int. Cl. F16c *7/04, 35/00*; **F01c** *21/00*

U.S. Cl. 418—73 **15 Claims**



The present disclosure relates to a method and apparatus for supporting a rotating element relative to a housing of a fluid translating device, by primary and secondary bearing means. The method contemplates supporting the rotating element for rotation about a fixed axis by the primary bearing means and diverting some of the pressured fluid in the high pressure port of the fluid translating device to chambers defined on a floating secondary bearing means adjacent an area of the rotor which is located adjacent the low pressure port to thereby balance the reaction forces produced on the rotor.

The apparatus for defining the chambers receiving the diverted fluid includes first and second sleeves receiving the rotor supporting shaft with each of the sleeves having a plurality of outer recesses cooperating with the housing to produce pockets or chambers and a plurality of inner recesses cooperating with the shaft to produce inner pockets or chambers. Each outer pocket receives diverted pressurized fluid from the port which is in opposed relationship on the rotor or shaft and the outer pocket communicates with the inner pocket to direct this fluid into the area between the shaft and the bearing sleeve.

The internal transverse dimension of the sleeves is slightly larger than the diameter of the shaft and the inner pockets are divided into first and second axially spaced portions so that any axial misalignment between the sleeves and the bearing will increase the flow path between the bearing and the shaft along one edge of the sleeve and decrease the flow path along the opposite edge to produce a pressure differential thereby automatically aligning the sleeve and shaft.

The area of the sleeve between each of the portions of the inner recess has laterally offset segments so that all portions of the shaft will be exposed to the pressured fluid during each revolution of the shaft.

3,814,555

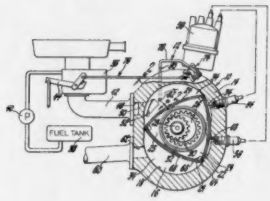
ROTARY ENGINE GAS SEAL LUBRICATION SYSTEM

James M. Casey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 14, 1972, Ser. No. 271,785

Int. Cl. F03c *3/00*

U.S. Cl. 418—99 **3 Claims**



A rotary engine having side wall intake ports is provided with oil feed ports that are also located in the side walls past the intake ports in the direction of rotor rotation with the oil feed ports receiving oil at a rate that increases with increasing load and feeding the metered oil for lubrication of the side walls against which the rotor's side and corner seals run against with oil distribution to the engine's internal peripheral wall against which the rotor's apex seals run against being effected by centrifugal force that acts to throw oil radially outward from the side and corner seals against this surface.

3,814,556

OIL SEAL CONSTRUCTION FOR ROTARY ENGINES

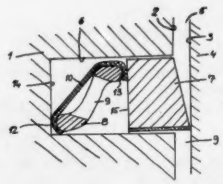
Gottlieb Wilmers, Friedhofstrasse 25, Neuenstadt, and Hermann Hillinger, Nurnberger Strasse 35, Heilbronn, both of Germany

Filed Mar. 9, 1973, Ser. No. 339,962

Claims priority, application Germany, Mar. 25, 1972, 7211511

Int. Cl. F01c *19/08*

U.S. Cl. 418—142 **3 Claims**



An oil seal construction for rotary engines includes an oil scraper ring disposed in an oil seal groove of the rotor. The ring extends into sealing contact with adjacent surfaces of the rotor housing wall. An annular Belleville type spring is

disposed in the groove for urging the ring against the wall. This spring possesses openings for decreasing stiffness with a cover of elastic material covering the opening while extending over surfaces of the spring abutting the grooved surfaces and scraper ring.

3,814,557

FLUID DISPLACEMENT APPARATUS HAVING HELICAL DISPLACEMENT ELEMENTS

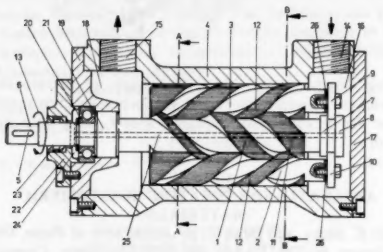
Hermann Volz, Konstanz, Germany, assignor to Allweiler AG, Radolfzell, Germany

Filed June 30, 1971, Ser. No. 158,479

Claims priority, application Germany, July 4, 1970, 2033201

Int. Cl. F01c *1/16*; **F03c** *3/00*; **F04c** *1/10*

U.S. Cl. 418—197 **18 Claims**



A fluid displacement apparatus, such as a pump or motor in which three helically splined elements are arranged in parallel and in meshing engagement. Profile discs are mounted on the elements to provide a predetermined pitch and a possible variation in the delivery surface. The discs are secured for relative movement with respect to the outer housing or the element on which they are mounted.

3,814,558

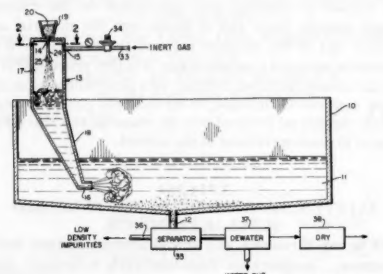
APPARATUS FOR PRODUCING LOW OXIDE METAL POWDERS

Maurice Donald Ayers, Stamford, Conn., assignor to Metal Innovations, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 855,096, Sept. 4, 1969, Pat. No. 3,646,176. This application Feb. 25, 1972, Ser. No. 229,307

Int. Cl. B22d *23/08*

U.S. Cl. 425—7 **16 Claims**



Apparatus is disclosed for producing high purity metal powders having an irregular and angular shape and a very low oxygen content (less than 0.25 percent oxygen in iron and steel powders). The invention utilizes a high pressure liquid atomization procedure for converting the molten metal to angular particulate form, and provides for the very rapid subsequent cooling of the hot particles under conditions of high pressure sprays and violent turbulence of the powder particles in the liquid that minimize the formation of oxide impurities on the particle surface. High pressure atomization to produce angular and irregular particles tends to create an oxidizing environment because of the mixture of hot particles and liquid. By rapidly quenching the particles immediately after formation, in a quenching environment that creates a violently turbulent condition at the surface of the metal, the formation of vapor or steam films is minimized and more rapid heat transfer from the particles to the cooling medium is realized.

3,814,559

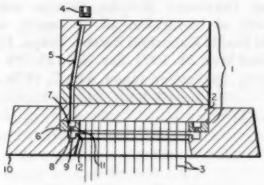
SPINNERET WITH INERT GAS METERING RING

Charles Amos Akers, II, Martinsville, Va., and Stanley Carleton Crewe, Signal Mountain, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1972, Ser. No. 301,536

Int. Cl. D01d *3/00*

U.S. Cl. 425—72 **4 Claims**



A conventional round spinneret is blanketed with inert gas by providing a passage for the gas through the spinning pack assembly to the lower face of the spinneret and providing a metering ring encircling the filament array and in contact with the lower face of the spinneret. In the upper surface of the ring is a groove for distributing gas around the filament array and a plurality of vertical holes connect the groove with the underside of the ring. Below the metering ring is a spinneret retainer ring with a groove in its upper surface in communication with the vertical holes in the metering ring. The retainer ring has a lip formed in its inner periphery which in conjunction with the metering ring forms an open slot through which inert gas passes laterally towards the filament array. The vertical holes are sized to provide an appreciable pressure drop through each hole while avoiding turbulent flow into the retainer ring groove which must diffuse the individual streams of gas and deliver the gas in a smooth uniform stream to the filaments through the slot.

3,814,560

APPARATUS FOR EXTRUDING TOROIDS OF SETTABLE SLURRIES WITH MEANS TO WASH THE EXTRUDATE DURING FORMATION AND SEVERANCE

Yechiel Smadar, New York; Howard Roth, Bronx; John P. McCarthy, College Point, and John Moyer, Garden City, all of N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

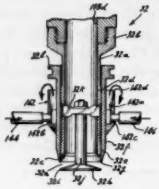
Division of Ser. No. 839,173, July 7, 1969, Pat. No. 3,650,765. This application Dec. 10, 1971, Ser. No. 206,962

Int. Cl. A21c *11/16*

U.S. Cl. 425—104 **1 Claim**

A method and apparatus for preparing food products wherein an extrudable slurry of the food product and a gel forming material which is settable upon exposure to a setting solution and is capable of forming a skin, is extruded into an elemental shape, such as a torroid, while washing the surfaces

of the elemental shape with the setting solution to form a skin onto the shape. Extrusion is continued to expand the elemental shape into a final extruded food product, with the skin serving to envelope and contain the initial slurry during further extrusion and until such time as the product is completed, as by further processing which may include coating and finally stabilizing the slurry as by cooking, baking, frying, freezing or the like.



3,814,561

SPINNERETS FOR PRODUCING MULTI-SEGMENT FILAMENTS

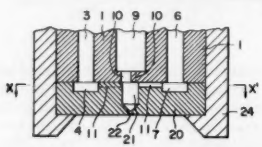
Masao Matsui, Takatsuki; Susumu Tokura, and Masahiro Yamabe, both of Neyagawa, all of Japan, assignors to Kanagafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1971, Ser. No. 129,799

Claims priority, application Japan, Apr. 7, 1970, 45-29924

Int. Cl. B29f *3/12*

U.S. Cl. 425—131 **13 Claims**



Multi-segment filaments can be obtained by feeding a flow of liquid spinning material composed of at least two thin layers, which extend radially from the center portion of the cross-section of a conduit towards the peripheral wall of the conduit so as to reach the peripheral wall, into the conduit from the upper end thereof, and at the same time feeding forcedly a flow of another spinning material into each of small sections between the above radial thin layers and the periphery wall of the conduit to put the above described thin layers between the flows of the latter spinning material, and then extruding the joined flow through the orifice, by the use of spinneret having a simple structure. There are two types of arrangements of the conduit, feed nozzle and duct, in one of which the thin layer forming spinning material is fed from the feed nozzle to the conduit, and in another of which the thin layer forming spinning material is fed from the duct into the conduit.

3,814,562

VACUUM FORMING APPARATUS

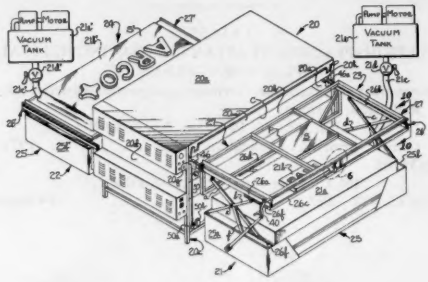
Harvey J. Diamond, Charlotte, N.C., assignor to Plasti-Vac, Inc., Charlotte, N.C.

Filed Mar. 13, 1972, Ser. No. 234,060

Int. Cl. B29f *5/00*

U.S. Cl. 425—174.4 **10 Claims**

Apparatus and method for vacuum forming sheets of thermoplastic material in which first and second sheet supporting and transporting means are employed for moving sheets of thermoplastic material between a heating means and respective first and second vacuum forming means for heating and softening of the sheets by the heating means and thereafter vacuum forming by the respective vacuum forming means. The heating means includes a pair of spaced apart radiant heating units between which the sheets of thermoplastic material are moved by the sheet supporting and transporting means for heating and softening sheets from both sides thereof.



3,814,563

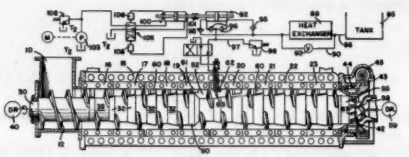
APPARATUS FOR TREATING ELASTOMERIC MATERIALS

Robert K. Slaby, and Dean K. Bredeson, both of Piqua, Ohio, assignors to The French Oil Mill Machinery Company, Peoria, Ohio

Continuation of Ser. No. 74,083, Sept. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 802,029, Feb. 25, 1969, Pat. No. 3,638,921. This application Aug. 14, 1972, Ser. No. 280,336

Int. Cl. B29b *1/10;* **B29f** *3/02*

U.S. Cl. 425—203 **5 Claims**



A machine for adding liquids such as oils to elastomeric materials such as rubber or various synthetic polymers is provided in the form of a continuous screw press with intermediate chambers where the material is worked under pressure. Liquid is supplied near the center of the chamber through injector bars, and is mixed into the material as it proceeds out of the chamber toward the press exit. If the elastomeric material contains water, it is first processed in the press to remove included moisture to a point where oil is compatible with rubber mixture; if the material contains volatile solvents, heated oil is mixed into the material and also used as an agent to promote release of the solvent.

3,814,564

SAFETY SUPPORTED PISTON FOR EXTRUDED TUBULAR ELEMENTS

Erwin Streng, Straubing, and Arnold Schurian, Bogen, both of Germany, assignors to Kunststoffwerk Gebruder Anger GmbH & Co., Munich, Germany

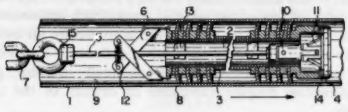
Filed Oct. 19, 1972, Ser. No. 298,807

Int. Cl. B29d *23/04*

U.S. Cl. 425—383 **8 Claims**

A safety supporting piston for extruded hollow members comprises a hollow plug portion whose forward end is closed

by a valve. A traction rod is connected to the valve and passes through the interior of the plug portion to be connected by a



chain to the mandrel of the extruder. The valve has a smaller mass and larger projected area than the plug portion so as to become separated therefrom upon breakage of the chain.

3,814,565

SUPPORT FOR RUBBER AND LIKE PIPES AND HOSES

Maurice Alphonse Jules Cahour; Truc Le Trung, and Lucien Gaston Signoret, all of Decize, France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France

Filed Feb. 9, 1972, Ser. No. 224,777

Claims priority, application France, Feb. 10, 1971, 71.04368; Mar. 8, 1971, 71.08005

Int. Cl. B29h *5/00*

U.S. Cl. 425—392 **2 Claims**

This invention relates to the manufacture of elbowed pipes from rubber and like elastomeric materials. The invention is based on the known method which consists in placing a straight pipe prior to vulcanisation in contact with a coaxially arranged deformable shaping element, whereafter the assembly of pipe and element is deformed to a desired shape and is then vulcanised, after which the pipe is separated from the element. According to the invention, the deformable shaping element is made from at least one metal helix. This metal helix is preferably preformed to the shape of the elbowed pipe to be produced. The invention also includes a deformable shaping element for use in the method. Although the expression "pipes" is used, it will be clear that it includes hoses and any other similar tubular member, where the context so admits.

3,814,566

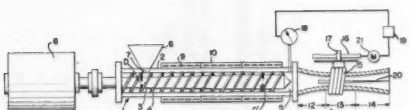
APPARATUS FOR CONTINUOUSLY CONVERTING MESOPHASE PITCH INTO A HIGHLY ORIENTED STRUCTURE

Robert C. Stroup, Bay Village, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 31, 1972, Ser. No. 302,571

Int. Cl. B29f *3/04;* **C04b** *35/54*

U.S. Cl. 425—144 **6 Claims**



An apparatus for continuously converting hydrocarbonaceous material, such as mesophase pitch, into an oriented structure, comprising an auger extruder coupled to a converging - straight - diverging forming die. The die has disposed around it a floating heating coil which is axially movable in response to the pressure-sensed at the discharge exit of the extruder.

3,814,567

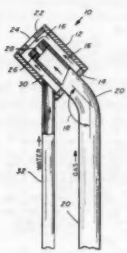
SMOKELESS FLARE USING LIQUID WATER PARTICLES

John Smith Zink; Robert D. Reed, and Hershel E. Goodnight, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 22, 1972, Ser. No. 228,010

Int. Cl. F23c *9/04*

U.S. Cl. 431—4 **14 Claims**



This disclosure describes a system for smokeless burning of hydrocarbon gases in which liquid water is used as input in place of the customary use of steam to provide the hydrogen necessary to accomplish complete smokeless combustion. A particular design of atomizer is used in which the pressure of gas provides the energy for atomizing the water into droplets of such small size that they will instantly evaporate in the flame, and provide the water vapor to reform the hydrocarbons and provide the necessary hydrogen-to-carbon ratio for smokeless combustion.

3,814,568

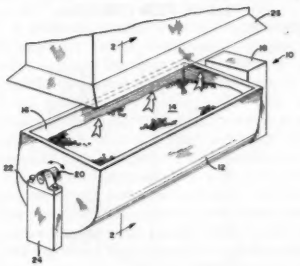
METHOD AND APPARATUS FOR INCINERATING LIQUIDS

Thomas J. Wittmann, Dayton, Ohio, assignor to Systems Technology Corporation, Dayton, Ohio

Filed May 25, 1973, Ser. No. 364,005

Int. Cl. F23d *21/00*

U.S. Cl. 431—7 **13 Claims**



A method and apparatus for incinerating liquid waste materials. The incinerator of the present invention has a heated combustion bed of aggregate particles contained in a combustion vessel. The vessel is agitated by mechanical means to provide a constant motion to the particles in the bed. The aggregate particles are of relatively large size to eliminate the

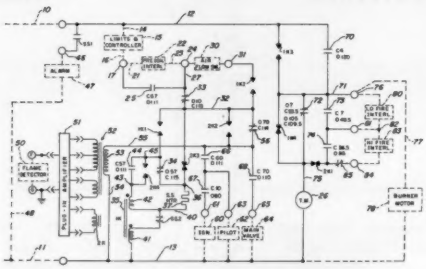
likelihood of solidification of the aggregate on shut down. Liquid waste materials, which may vary widely in viscosities and may contain widely varying concentrations of solid matter, are introduced into the combustion vessel and incinerated therein. Exhaust means are provided.

3,814,569

PROGRAMING BURNER CONTROL DEVICE

Roelof F. Jacobsz, Blaine, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 15, 1973, Ser. No. 323,576
Int. Cl. F23m *5/00*
U.S. Cl. 431—29 **8 Claims**



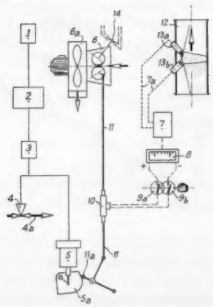
A programing burner control device is disclosed which responds to a flame detector, condition responsive interlocks, and initiating control to properly sequence a fuel burner system through prepurge, ignition, burner operation, and post purge periods. The burner control device utilizes relay means which respond to the flame sensor and the initiating control, along with a number of cam operated switches to provide the necessary sequencing of the device. The burner control device utilizes a pair of flame relay contacts in the motor driven cam circuit, and the safety switch heater circuit, so that the present burner control device can monitor proper operation of the burner during both the prepurge and the normal operating period of the burner system.

3,814,570

APPARATUS FOR AUTOMATIC CORRECTION OF THE POSITIONING CONTROL OF A BURNER

Frederic Guigues, 1, Allee de la Bastide des Cypres, 13100 Aix-en-Provence, and Marcel T. Pillard, 6, Avenue Frederic Mistral, 13008 Marseille, both of France

Filed May 1, 1973, Ser. No. 356,230
Claims priority, application France, May 1, 1972, 72.20971
Int. Cl. F23h *1/02, 5/08*
U.S. Cl. 431—76 **8 Claims**



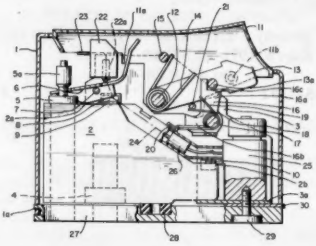
Apparatus for automatically correcting the ratio between the volumetric flows of combustion air and of fuel of a burner comprising an opacimeter which delivers an electric signal proportional to the opacity of the fumes of combustion and a servo mechanism, for example an electric ram controlled by said signal, which automatically varies a dimension, for example the length, of one of the pivoted arms which automatically controls the degree of opening of the combustion air control valve. The apparatus equipped with a reflection opacimeter highly sensitive to fumes which are practically invisible, gives good combustion despite variations of density of the combustion air.

3,814,571

PIEZOELECTRIC SMOKER'S LIGHTER

Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogy Kabushiki Kaishya, Kawaguchi-shi, Japan

Filed Mar. 15, 1972, Ser. No. 234,949
Claims priority, application Japan, Dec. 19, 1970, 45-127743; Dec. 19, 1970, 45-127741
Int. Cl. F23q *2/08*
U.S. Cl. 431—132 **8 Claims**



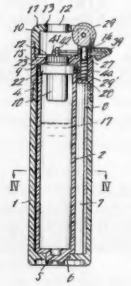
A piezoelectric smoker's lighter includes a fuel reservoir having a fuel spouting valve, and a chassis provided with a high voltage generating device, with the chassis having at least a portion thereof which is adapted to engage in a contacting relationship with the fuel reservoir and a portion which is adapted to be secured in a fixed manner to a bottom portion of the casing by a securing means.

3,814,572

THROW AWAY GAS LIGHTER

Kazuo Nitta, 416-6 Yamahara, Shimizu, Japan

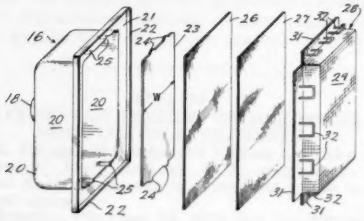
Filed Mar. 12, 1973, Ser. No. 340,604
Claims priority, application Japan, Mar. 14, 1972, 47-29935; July 10, 1972, 47-80581
Int. Cl. F23q *2/00*
U.S. Cl. 431—143 **5 Claims**



A throw away gas-lighter comprising a transparent plastic body, a fuel reservoir received in the body for rotational

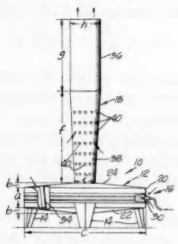
movement relative to the body and having gas flow adjusting means, an intermediate member secured to said body, a nozzle assembly including a tubular member secured to the intermediate member and a nozzle body secured to said reservoir for movement relative to the tubular member, an ignition mechanism operatively mounted on said intermediate member.

3,814,573
RADIANT HEATER BURNER CONSTRUCTION
Arthur Raymond Karlovetz, Fremont, Ohio, assignor to International Magna Corporation, Cleveland, Ohio
Filed Dec. 27, 1971, Ser. No. 212,214
Int. Cl. F23c *13/14*
U.S. Cl. 431—329 **1 Claim**



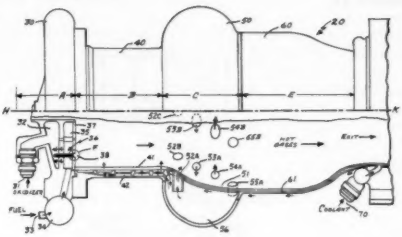
An improved construction for the burner of a gas-fired, radiant heater in which a plurality of reverberator, combustion and guard grids are attached over the open face of a shaped plenum enclosure with common fasteners positioned around the periphery of and outside of the plenum. Between the grids and the fuel entrance to the plenum is a novel baffle plate secured within the plenum enclosure which acts to diffuse the fuel-air stream passing towards the grids and to thermally separate the rear of the plenum from the combustion area, thereby improving the directional heating characteristics of the device.

3,814,574
HEATER
Reginald Darley, Santa Ana, Calif., assignor to Scheu Manufacturing Company, Upland, Calif.
Filed Sept. 22, 1972, Ser. No. 291,299
Int. Cl. F23d *5/02*
U.S. Cl. 431—338 **10 Claims**



A heater having primary and secondary fire combustion chambers, the primary chamber being formed by a bowl and the secondary chamber being formed by a stack vertically disposed atop the bowl and communicating with the primary combustion chamber. A nozzle assembly is provided for spraying fuel into the primary chamber, and the stack has secondary fire draft holes therein. The primary combustion chamber has a plurality of primary draft or air entry holes in the upper surface thereof, and a fire stabilizing device in the form of an arcuate shield is disposed between the primary draft holes and the nozzle assembly. The shield deflects the incoming air about the inside periphery of the primary chamber for providing thorough mixing of the fuel and air, the burning of a portion of the mixture in the primary combustion chamber. Ultimate complete combustion occurs in the secondary combustion chamber. The heater may be used as a pipeline heater in an automated system with a plurality of similar heaters.

3,814,575
COMBUSTION DEVICE
George B. Cox, Jr., and Ralph M. Huls, both of Jupiter, Fla., assignors to The United States of America as represented by the Secretary of the Department of the Air Force, Washington, D.C.
Filed Apr. 25, 1973, Ser. No. 354,261
Int. Cl. F23d *15/02*
U.S. Cl. 431—352 **4 Claims**



A combustion device adapted for use as an injector and combustor for an advanced combustor rig which is suitably connected to a source of liquid oxidizer, a source of gaseous fuel, and a source of dilution gas coolant, and which has a suitable positioned ignitor and an exit. The combustion device is preferably structured in successively adjacent, axially aligned, connected sections or regions, e.g., a primary injector section, a primary combustor section, a dilution injector section, and a mixing section which leads to the combustion device exit. A preferred embodiment of the particular adaptation of the inventive device comprises: a primary injector which includes a coaxial injection means, comprising an inner cylindrical oxidizer injection element surrounded by an annulus shaped fuel injection orifice, and which also includes a transpirationally-cooled injector face plate which is preferably made of woven and sintered wire mesh; a primary combustor, in communication with, and rearward of the primary injector; a dilution injector, in communication with, and rearward of, the primary combustor; and a dilutor mixer, in communication with, and rearward of the dilution injector. In essence, the primary injector atomizes the liquid oxidizer and introduces and mixes the atomized liquid oxidizer and the gaseous fuel which, in turn, react within the primary combustor. The dilution injector introduces the dilution gas into the high temperature gases from the primary combustor and generates the turbulence required for thorough mixing; and, the dilutor mixer provides a volume within which mixing between the dilution gas and the high temperature gases occurs. The inventive device, unlike the prior art, permits use of either liquid or gaseous oxidizer; is structurally approximately 40 percent

shorter for a given flowrate; results in a more uniformly axial flowfield in the primary combustor, and therefore lower heat fluxes; and, allows for more simple manifolding.

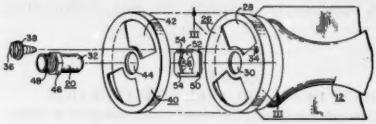
3,814,576

GAS BURNER MOUNTING ARRANGEMENT

Woodrow W. Brockhurst, Parma, Ohio, assignor to Luxaire Inc., Elyria, Ohio

Filed Mar. 7, 1973, Ser. No. 338,717
Int. Cl. F23d *13/40*
U.S. Cl. 431—354 **5 Claims**

A gas burner mounting arrangement for a burner which is subject to axial displacement relative to the gas supply manifold and the heat exchanger, in which the primary air adjusting shutter for the burner is held in a fixed position, relative to axial movement, on an orifice spud, and the upstream end plate of the burner is then locked to the air shutter by the shutter adjusting screw. The primary air shutter is held in the fixed position against axial movement by a simple friction locking clip.



CHEMICAL

3,814,577
METHOD FOR PRODUCING GRAPHITIZABLE SUBSTRATES FROM ACRYLIC FIBERS
Virginia C. Menikheim, Chapel Hill, N.C., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed July 27, 1972, Ser. No. 275,846
Int. Cl. C01b *31/07;* **D06c** *7/04*
U.S. Cl. 8—115.5 **5 Claims**

A process is provided for producing a heat-stabilized char or substrate from acrylic fibers which can be converted into high quality carbon or graphite fibers. The process involves first treating the fibers in a diethanolamine or triethanolamine solution followed by an oxidation at elevated temperatures in an oxygen containing atmosphere. The pre-oxidation treatment drastically reduces the time required to effect the necessary oxidation, and the heat-stabilized substrate obtained yields carbon and/or graphite fibers of improved quality.

3,814,578
TREATMENT OF TEXTILES WITH GLYCIDOL-MODIFIED POLYURETHANES
Allen G. Pittman, El Cerrito, and William L. Wasley and Carlton C. Jones, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Jan. 14, 1972, Ser. No. 217,963
Int. Cl. D06m *3/08, 15/52*
U.S. Cl. 8—127.6 **7 Claims**

Polyurethanes containing isocyanate groups are reacted with glycidol to prepare glycidol-modified polyurethanes useful for application to textile materials to improve their properties, e.g., to impart shrink resistance. Typical example: A polyether polyurethane containing free NCO groups is reacted with glycidol to yield a glycidol-modified polymer which is formed into an emulsion and applied to a textile material. The treated textile may be directly cured or the curing operation may be delayed until the fabric is manufactured into a finished garment.

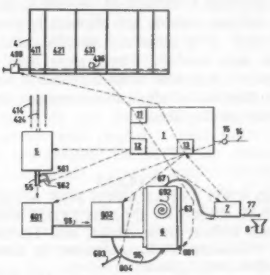
3,814,579
PROCESS FOR ONE-BATH DYEING AND PRINTING OF TEXTILE MATERIAL
Walter Birke, Hans-Ulrich von der Eltz, and Fritz Meininger, Frankfurt am Main, Peter Mischke, Hofheim, Taunus, and Franz Schon, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Sept. 15, 1972, Ser. No. 289,748
Claims priority, application Germany, Sept. 18, 1971, P 21 46 762.9
Int. Cl. D06p *1/38, 5/04*
U.S. Cl. 8—163 **15 Claims**

Process for the one-bath dyeing and printing of textile material made of synthetic or natural fibers or mixtures of such fibers, with appropriate dyestuffs according to a continuous or semi-continuous pad-dyeing or printing method by applying to the material a padding liquor or a printing paste containing an organic solvent, one or more organic dyestuffs, if required a chemical agent for the fixation of these dyestuffs, water and a phosphine oxide and/or an amine oxide, and subjecting the dyed material thus treated, optionally after an intermediate drying operation, to the action of heat below the softening point of the fibrous material or allowing it to dwell at room temperature or at a moderately elevated temperature, for the fixation of the dyestuff on the fiber.

3,814,580
METHOD FOR IMPARTING DURABLE PRESS PROPERTIES TO CELLULOSIC FABRICS
Gerfried Pruckmayr, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Feb. 16, 1971, Ser. No. 115,744
Int. Cl. D06m *15/54, 15/58, 99/02*
U.S. Cl. 8—186 **3 Claims**

Novel dimethylol - N,N′ - aliphatic - bis-imidazolidones having from 2 to 10 carbon atoms in the aliphatic group are capable of cross-linking with cellulosic materials and imparting durable press properties to cotton and other cellulose-containing fabrics without materially reducing the tear strengths of such fabrics.

3,814,581
METHOD AND APPARATUS FOR REMOVING UNDESIRABLE SOLUBLE SUBSTANCES FROM CHEMICAL COMPOSITIONS
Matti Reunanen, Kupittaankatu 11–13 C 38, Turku, Finland
Filed Mar. 19, 1971, Ser. No. 125,989
Claims priority, application Finland, Mar. 20, 1970, 801/70
Int. Cl. B01j *1/22;* **G01n** *31/06, 33/16*
U.S. Cl. 23—230 R **11 Claims**

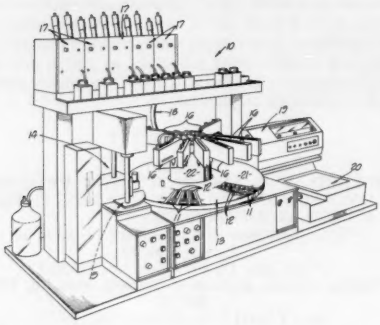


A method and an apparatus for washing molecules that are to be fixed in a medium clean of undesirable soluble molecules, whereby the desired compound is absorbed into the medium. Sample medium plates containing the desired compound are then rinsed with wash solutions in a wash tank and the wash solutions are removed by means of gas blown through the tank.

3,814,582
AUTOMATED CHEMICAL ANALYSER SYSTEM
Donald G. Rohrbaugh, Santa Ana, Everett James Petersen, Jr., Glendora, Charles Peter Chase, Brea, and William Robert Pearson, Placentia, Calif., assignors to Beckman Instruments, Inc.
Filed Mar. 2, 1972, Ser. No. 231,351
Int. Cl. G01n *1/14, 1/18*
U.S. Cl. 23—230 R **4 Claims**

A modular chemical analyser system provides for the analysis of a wide range of chemical products in diverse serialized repetitive automated processes. Typically, a solid tablet sample is placed in a sample reactor module and this module is paired with an analysis tube module, both positioned in specific apertures of a chemical analysis rotary module. A chemical analysis sample dissolver

module typically cooperatively provides a scheduled solvent volume, disrupts, stirs and dissolves the sample in the solvent, and makes a filtered solution available in the reactor module. Each reactor module accommodates an individual sample solution in the sequential processing on the rotary module. A multiplicity of cooperative liquid volume probe means are concentrically disposed on a central reciprocating elevator means. They provide, in



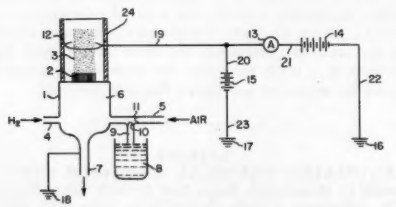
conjunction with a multiplicity of chemical solution pump means, programmed individual volumes of individual chemical solutions suitable for chemically processing the sample solution in a serialized specific pair of reactor module and tube module. The system finally yields an aliquot analysis solution sample suitable for a direct quantitative chemical analysis measurement, as by a spectrophotometer or the like.

3,814,583

METHOD AND APPARATUS FOR ANALYZING ORGANIC CARBON IN AQUEOUS SYSTEMS

William John Miller, Belle Mead, and Hartwell Forrest Calcote, Princeton, N.J., assignors to Aerochem Research Laboratories, Inc.

Filed June 7, 1972, Ser. No. 260,500
Int. Cl. G01n *31/12, 33/18*
U.S. Cl. 23—230 R **13 Claims**



Organic carbon in an aqueous medium is burned and detected in a flame ionization unit in which the water undergoing analysis is atomized to a fine spray. The fine water spray passes into the combustion zone of a hydrogen flame where the organic carbon compounds are ionized. The ionized carbon compounds are detected by a collection electrode which is connected to an electronic circuit. Ion exchangers are used to remove inorganic materials, such as, alkali metal salts which interfere with the analysis, from salt-containing water.

3,814,584

ANALYTICAL METHOD EMPLOYING ACTIVE MATERIAL CONTAINED IN A FLOW-THROUGH BAG

Paul M. Tocci, Miami, Fla., assignor to TLC Corporation, Miami, Fla.

No Drawing. Filed Sept. 7, 1972, Ser. No. 286,904
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **10 Claims**

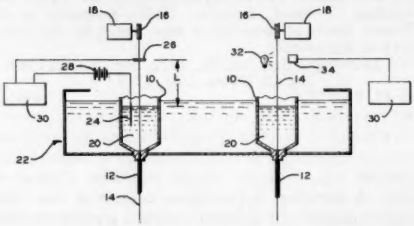
A method of determining the presence of certain constituents in biological samples in which a bag, similar in construction to the well-known flow-thru tea bag, which contains one or more active solid materials used in analytical procedures, is used to capture certain compounds present in the biological product, such as urine or blood, so as to concentrate the compound preferentially, or to bring about a particular type of chemical action such as hydrolysis, or for clarifying solutions.

3,814,585

METHOD AND APPARATUS FOR TESTING BLOOD COAGULATION

Robert T. Bailly, Hinman Road, Barneveld, N.Y. 13304

Filed Sept. 26, 1972, Ser. No. 292,399
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **10 Claims**



A freshly drawn sample of venous blood is placed in a container, such as a hypodermic syringe, and a thread is moved lengthwise through the sample until a substantially continuous mass of fibrin and/or red blood cells form thereon, marking the endpoint of the test. The thread is of a material to which blood coagulation substances adhere, preferably a water wettable material such as glass, or plant or animal fibers, e.g., cotton or wool. The thread may be inserted through the needle of the syringe and an electric motor with suitable reduction gearing used to draw the thread through the needle and blood sample within the syringe at an appropriate speed, e.g., a few millimeters per minute. The endpoint may be noted visually or by electrical, optical, or any other suitable sensing means.

3,814,586

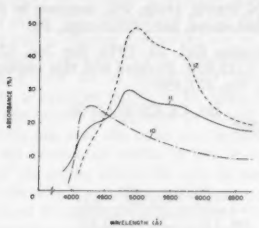
COMPOSITION, METHOD AND DEVICE FOR DETERMINING BILIRUBIN AND UROBILINOGEN

Joseph Wilfred Fraser, Jr., Osceola, and Charles T. W. Lam and Raymond L. Mast, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 2, 1973, Ser. No. 320,117
Int. Cl. G01n *21/20, 33/16*
U.S. Cl. 23—230 B **23 Claims**

4,4'-biphenyldiazonium salts in test compositions and devices capable of differential determination of both bilirubin and urobilinogen in an aqueous solution or body fluid such as urine. In addition to a 4,4'-biphenyldiazonium salt, the test compositions preferably include an acid constitutent capable of producing an acid pH upon contacting the aqueous solution to be tested. The test device comprises a bibulous carrier member such as paper

incorporated with the test composition in dry form. The method includes contacting the test composition with the



aqueous solution to be tested and observing the response either visually or spectrophotometrically.

3,814,587
METHOD FOR MONITORING AN AQUEOUS STREAM FOR THE PRESENCE OF FLUOROCARBONS

William S. Pappas, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

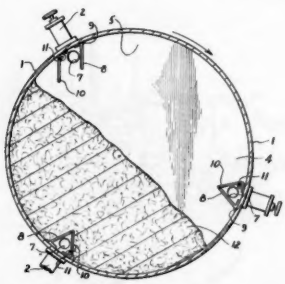
No Drawing. Filed Jan. 15, 1973, Ser. No. 323,499
Int. Cl. G01n *33/18*
U.S. Cl. 23—230 M **8 Claims**

A method for monitoring a stream of cooling water for the presence of minute concentrations (e.g., 2 p.p.b.) of fluorocarbon. A stream of the cooling water is passed in fluorocarbon-exchanging contact with a selected trapped volume of gas, preferably for a time sufficient to establish equilbrium between the gas and water phases. Because of the preferential concentration of the fluorocarbon in the trapped gas, the presence of the fluorocarbon therein can be readily detected with conventional instrumentation.

3,814,588
APPARATUS FOR MAKING ORGANIC FERTILIZER

Eric W. Eweson, 465 Park Ave., New York, N.Y. 10022, and Anthony Frazer Eweson, Many Skies, Silverton, British Columbia, Canada

Filed May 10, 1972, Ser. No. 252,324
Int. Cl. C05f *9/02*
U.S. Cl. 23—259.1 **3 Claims**

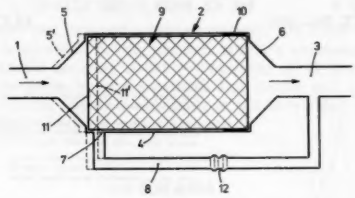


A device for protecting air passages and valves is provided for use in rotary digesters for the aerobic decomposition of waste organic material. One type of such digester is divided into a series of compartments by partitions. Passages for the flow of air and generated gases are provided in the partitions and valve controlled passages are provided to vent the compartments to the outside. These passages are protected by a cover structure which includes a hinged baffle which is closed when the passages are buried in the material during rotation of the digester and which open when the passages emerge from the material.

3,814,589
CONVERTER FOR CATALYTIC EXHAUST GAS CLEANING

Herbert Heitland, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed June 12, 1972, Ser. No. 262,004
Claims priority, application Germany, June 11, 1971, P 21 28 990.7
Int. Cl. F01n *3/14;* **B01j** *9/04*
U.S. Cl. 23—288 F **5 Claims**



A housing having an input for exhaust gas and an output for emitting the cleaned exhaust gas, the housing is made from a material having a high positive coefficient of expansion under heat, a catalyzator body placed in the housing and being secured in it at one end thereof downstream of the gas flow and being made from a material having a low coefficient of expansion under heat, the catalyzator body and the housing being arranged for relative movement with respect to each other under heat expansion of the housing except for the secured portion of the catalyzator body, a bypass conduit having an input opening to housing at a region upstream of the exhaust gas flow and adapted to connect the input to the housing with the output thereof when the input opening of such pipe conduit is opened, the catalyzator body is mounted in the housing for covering the input opening of the bypass conduit at a predetermined range of temperatures of the exhaust gas and thereby forcing the exhaust gas to pass through the catalyzator to the output of the housing, the catalyzator uncovering the input opening at least partly and thereafter increasingly uncovering it above a predetermined temperature range of the gases when the housing moves under heat expansion relative to the catalyzator.

3,814,590
ALUMINOUS METAL ARTICLES AND ALUMINUM BASE ALLOYS

Linton D. Bylund, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Application July 9, 1970, Ser. No. 889,790, now Patent No. 3,691,972, which is a division of application Ser. No. 712,314, Jan. 16, 1968, now Patent No. 3,571,910, which is a division of application Ser. No. 660,132, Aug. 11, 1967, now Patent No. 3,397,044, which is a continuation-in-part of abandoned application Ser. No. 573,776, Aug. 8, 1966, which in turn is a continuation-in-part of abandoned application Ser. No. 379,782, July 2, 1964. Divided and this application Mar. 15, 1972, Ser. No. 234,780
The portion of the term of the patent subsequent to Aug. 13, 1985, has been disclaimed
Int. Cl. B22f *5/00*
U.S. Cl. 29—183 **23 Claims**

Aluminum foil and other wrought articles including drawn and ironed can bodies are produced from aluminum

base alloys containing up to about 2.5% iron, having a a low work hardening rate above 75% reduction and sufficient ductility at high cold work levels to permit cold working to the extent of at least 90% without the necessity of annealing or stress relieving. Included are Al-Fe-Mg, Al-Fe-Mn and Al-Fe-Mg-Mn alloy systems.

3,814,591

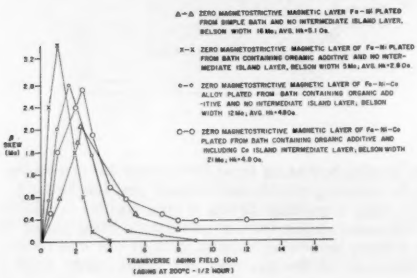
PLATED WIRE MEMORY ELEMENT

James O. Holmen, Minnetonka, and Robert P. Ulmer, Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 30, 1972, Ser. No. 267,785

Int. Cl. B32b *15/00*

U.S. Cl. 29—194 **15 Claims**


Δ–Δ ZERO MAGNETOSTRICTIVE MAGNETIC LAYER Fe–Ni PLATED FROM SIMPLE BATH AND NO INTERMEDIATE ISLAND LAYER, BELSON WIDTH 16 Me, AVG. Hk=5.1 Oe.
X–X ZERO MAGNETOSTRICTIVE MAGNETIC LAYER OF Fe–Ni PLATED FROM BATH CONTAINING ORGANIC ADDITIVE AND NO INTERMEDIATE ISLAND LAYER, BELSON WIDTH 5 Me, AVG. Hk=2.8 Oe.
o–o ZERO MAGNETOSTRICTIVE MAGNETIC LAYER OF Fe–Ni–Co ALLOY PLATED FROM BATH CONTAINING ORGANIC ADDITIVE AND NO INTERMEDIATE ISLAND LAYER, BELSON WIDTH 12 Me, AVG. Hk=4.8 Oe.
□–□ ZERO MAGNETOSTRICTIVE MAGNETIC LAYER OF Fe–Ni–Co PLATED FROM BATH CONTAINING ORGANIC ADDITIVE AND INCLUDING Cu ISLAND INTERMEDIATE LAYER, BELSON WIDTH 21 Me, Hk=4.8 Oe.
A SHIFT (Oe)
TRANSVERSE AGING FIELD (Oe)
(AGING AT 200°C - 1/2 HOUR)

A plated wire memory unit which combines increased read-write speed with good non-destructive readout (NDRO) properties includes a non-magnetic wire substrate, a non-magnetic layer of controlled roughness overlaying the substrate, a thin layer of material selected from a group consisting of cobalt, nickel, iron or magnetic alloys thereof overlaying the non-magnetic layer and a zero magnetostrictive magnetic layer of nickel-iron-cobalt alloy overlaying the thin layer. The final nickel-iron-cobalt alloy zero magnetostrictive magnetic layer is electrodeposited from an electrolytic bath containing an aromatic sulfonic acid or a substituted aromatic sulfonic acid additive.

3,814,592

METHOD OF SIZING GLASS FIBER STRAND AND ARTICLES PRODUCED THEREFROM

Donald E. McWilliams, 523 Central Ave. 15238; Charles W. Killmeyer, 1065 Ardmore Manor Drive 15221; and George E. Eilerman, 100 Richmond Drive 15237, all of Pittsburgh, Pa.

No Drawing. Application July 8, 1971, Ser. No. 160,932, which is a continuation-in-part of abandoned application Ser. No. 726,584, May 3, 1968. Divided and this application July 30, 1973, Ser. No. 383,876

Int. Cl. C03c *25/02*; C08g *51/10*

U.S. Cl. 65—3 **3 Claims**

Nylon resin is reinforced with glass fiber strand which is sized during forming with a size composed of an aqueous, stable emulsion of a polyurethane resin, an amino silane, a textile lubricant and an emulsifying agent.

3,814,593

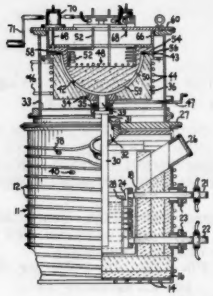
PRESSURE MOLDING OF GLASS ARTICLES APPARATUS

Joseph N. Parris, Irwin, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Original application Oct. 21, 1970, Ser. No. 82,768, now Patent No. 3,725,023. Divided and this application Jan. 5, 1973, Ser. No. 321,498

Int. Cl. C03b *11/00*

U.S. Cl. 65—305 **4 Claims**



Apparatus for pressure forming glass sheets, in particular hemispheres, by casting molten glass under pressure between graphite molds while the molds are maintained within a desired temperature range below a temperature at which molten glass adheres to graphite and above a temperature at which the molds cause chill cracking and optical defects in the surfaces of the cast glass.

3,814,594

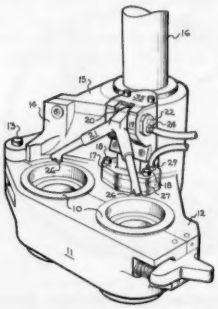
BLANK MOLD SPRAY

Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc.

Filed Nov. 17, 1972, Ser. No. 307,603

Int. Cl. C03b *39/00*

U.S. Cl. 65—169 **5 Claims**



Automatic lubrication spray apparatus for glass forming molds which is positioned on one side of the molds for clearance from the seating of baffles and charging of

glass. The spray is controlled by the nozzle size, air pressure, and lubricant concentration. The spray is delivered through a nozzle on the end of an arm positioned above the mold in coaxial alignment with the vertical axis of the mold. The arm pivots about the end opposite the nozzles and is rotated downward out of position by a rack and pinion actuated by a pneumatically operated piston with a rack on its upper end. The piston works vertically in a cylinder which is an integral part of the structure. The piston is opposed by a coil spring which holds the arm out over the mold and in position to spray whenever the pneumatic piston is not in operation. The resiliency of the spring allows the arm to move downward and out of the way if a baffle comes down out of sequence to a position of interference with the arm. The arm moves without sustaining damage which could cause costly delays.

3,814,595

GRANULATION OF LANGBEINITE

Albert F. Boeglin and Edward A. Chowning, Carlsbad, N. Mex., assignors to International Minerals & Chemical Corporation

No Drawing. Filed Mar. 1, 1973, Ser. No. 337,089

Int. Cl. C05d *11/00*

U.S. Cl. 71—61 **5 Claims**

Fine langbeinite particles are granulated by first preparing a langbeinite material sized such as it is not more than 10% +35 mesh, 15% to 35% −200 mesh, with the remainder being −35 +200 mesh. The sized langbeinite is wetted to a moisture content of 6.5 to 11.5% by weight of the langbeinite. The resulting mass is granulated, cured for at least two hours, and dried to a moisture content of 2% to 5%. Product temperature is maintained below a maximum of 300° F. and the maximum temperature of gases contacting the product is maintained below 1200° F.

3,814,596

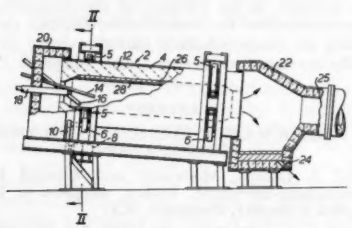
PROCESS FOR MAKING IRON OR STEEL

Ernest Wallace Voice, East Molesey, and David Alec Hawkes, Guisborough, England, assignors to The British Iron and Steel Research Association, London, England

Filed Dec. 29, 1970, Ser. No. 102,394

Int. Cl. C21b *11/06*

U.S. Cl. 75—40 **2 Claims**



Apparatus for making iron consists of a generally horizontally disposed rotary furnace lined with refractory materials into the inlet end of which is fed iron ore in particulate form, coal, and fuel oil and oxygen. The furnace is rotated at a sufficient speed to spread the contents of the furnace in a layer around the inner surface of the furnace under centrifugal force with the iron that is formed maintained as an outer layer against the refractory material and with the less heavy layer of slag lying on the layer of iron. By changing the rotational speed of the furnace the slag is mixed with the iron to promote a high rate of reaction. Iron is discharged from the outlet end of the furnace. The method is also applicable to steel making.

3,814,597

ABRASION RESISTANT CAST FERROUS ALLOYS

Samuel A. Sholl, Clearfield, Pa., assignor to Clearfield Machine Company, Clearfield, Pa.

No Drawing. Filed Sept. 27, 1971, Ser. No. 183,876

Int. Cl. C22c *37/00, 37/100*

U.S. Cl. 75—123 CB **5 Claims**

A new cast iron and article of manufacture made therefrom is provided having unusual abrasive resistance and an oriented lamellar structure consisting of at least one member from the group pearlite and bainite and a complex carbidic structure consisting of boron nitrides, boron carbides and other boron compounds.

3,814,598

WEAR RESISTANT POWDER METAL MAGNETIC POLE PIECE MADE FROM OXIDE COATED Fe-Al-Si POWDERS

James M. Gabriel, Monsey, N.Y., and William Reilly, Fort Lee, N.J., assignors to Chromalloy American Corporation

Original application Dec. 29, 1970, Ser. No. 102,364, now Patent No. 3,739,445. Divided and this application Mar. 27, 1973, Ser. No. 345,343

Int. Cl. B22f *3/14;* **G11b** *5/40*

U.S. Cl. 75—206 **5 Claims**

A powder metallurgy produced wear resistant magnetic pole piece for use as a pickup head with magnetic playback tapes is provided made of a magnetically soft ferrous alloy containing effective amounts of silicon and aluminum. A powder of the alloy is oxidized to provide a thin oxide on the particle thereof. The powder is then hot pressed in vacuum at an elevated temperature into a dense sintered body. The presence of oxide in the grain boundaries confers wear resistant properties to the alloy. An oxygen content of about 3400 to 4400 p.p.m. is preferred.

3,814,599

ELECTROPHOTOGRAPHIC TRANSFER PROCESS

David A. Cree, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 6, 1971, Ser. No. 160,065

Int. Cl. G03g *13/16*

U.S. Cl. 96—1.4 **7 Claims**

Image receiving elements are provided for receiving patterns of electroscopic toner particles. These elements are comprised of a fibrous support bearing on one surface thereof, a layer of an electrically conductive polymer comprisng a salt of a carboxy ester lactone resin. The fibrous support should have a volume resistivity of at least about 10^9 ohm-cm., and said layer should have a surface resistivity less than about 10^9 ohms per square. An additional layer can be provided between the support and the first named layer to resist penetration of liquid developer. An example of resin for the first named layer is a sodium salt of a hydrated interpolymer of maleic anhydride and vinyl acetate. The invention also concerns

an electrophotographic process utilizing the novel image receiving element to receive a toner image from an image-carrying element.

3,814,600

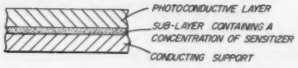
ELECTROPHOTOGRAPHIC ELEMENT

Lawrence E. Contois, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original application June 30, 1970, Ser. No. 51,252, now Patent No. 3,684,548, dated Aug. 15, 1972. Divided and this application Feb. 10, 1972, Ser. No. 225,316

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.6 **3 Claims**



A process is described for the dye sensitization of electrophotographic elements. The dye is concentrated in a thin layer by preferential absorption from the photoconductive layer into a subbing layer having a greater affinity for the dye.

3,814,601

GRAINLESS PHOTOGRAPHIC MEDIUM AND METHOD OF MAKING SAME

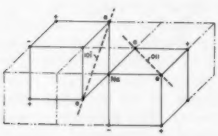
Irwin Schneider, 2402 Daphne Lane, Alexandria, Va. 22306

Filed July 21, 1972, Ser. No. 273,914

The portion of the term of the patent subsequent to Mar. 13, 1990, has been disclaimed

Int. Cl. G03c *1/00, 5/04*

U.S. Cl. 96—27 E **4 Claims**



Alkali halide crystals containing anisotropic defects called color centers are used as a photographic medium. The operation of this medium is based on the principle that these anisotropic color centers in the crystal can be aligned and then realigned to produce an image using linearly polarized illumination of a predetermined wavelength.

3,814,602

PROCESS FOR PRODUCING A PHOTOLITHOGRAPHIC PRINTING PLATE

Fumiaki Shinozaki, Tomoaki Ikeda, Yoshito Mukaida, and Masayoshi Tsuboi, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed July 17, 1972, Ser. No. 272,510

Claims priority, application Japan, July 15, 1971, 46/52,579

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 L **20 Claims**

In a process for producing a photolithographic printing plate which comprises forming by the diffusion transfer process a reversal silver image of an original image on a hydrophilic surface portion of a cellulose organic acid ester sheet having a hydrophilic surface portion containing a silver halide developing nucleus substance used in the diffusion transfer process and removing the hydrophilic surface portion having said silver image to expose an oleophilic surface of said cellulose organic acid ester sheet, the improvement which comprises removing said hydrophilic surface portion having said silver image with an aqueous etching solution containing a peroxodisulfate is disclosed.

3,814,603

METHOD FOR PREPARING LITHOGRAPHIC PRINTING PLATE

Yoshito Mukaida, Kikuo Kubotera, and Eiiche Mizuki, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Oct. 5, 1970, Ser. No. 77,930

Claims priority, application Japan, Oct. 4, 1969, 44/79,534; July 28, 1970, 45/65,858

Int. Cl. G03f *7/02*

U.S. Cl. 96—33 **10 Claims**

There is provided, a method for preparing a lithographic printing plate, which comprises (1) hydrolyzing the surface of a sheet consisting essentially of an oleophilic cellulose organic acid ester to render the surface thereof hydrophilic, (2) impregnating a nucleus material for use in a silver diffusion transfer process into the hydrophilic surface of said sheet, (3) forming a silver image in the hydrophilic surface of said sheet through a silver diffusion transfer process, and (4) removing the silver image-bearing portion of the hydrophilic surface of said sheet by treating said surface of said sheet with an aqueous etching solution containing hydrogen peroxide, whereby the oleophilic body of said cellulose organic ester sheet is exposed in those areas corresponding to the image-containing areas.

3,814,604

PHOTOIMAGING SYSTEMS BASED UPON PHOTOSENSITIZED REARRANGEMENT OF N-VINYLSULFONAMIDES TO β-SULFONYLVINYLAMINES

Walter R. Hertler, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Mar. 6, 1972, Ser. No. 232,224

Int. Cl. G03c *5/24, 1/00*

U.S. Cl. 96—48 R **9 Claims**

A method for the imagewise conversion by light radiation, generally in the presence of photoinitiators, of N-vinylsulfonamides to β-sulfonylvinylamines, the latter yielding an image which is directly visible or subsequently developed to produce a clear image.

3,814,605

PHOTOGRAPHIC ELEMENTS AND THEIR PREPARATION

Daniel J. Gallois, Mericourt, and Bernard Pouillot, Champigny-sur-Marne, France, assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,895

Claims priority, application France, Jan. 15, 1971, 7101234

Int. Cl. G03c *1/84, 5/06, 5/32, 5/50, 7/00*

U.S. Cl. 96—58 **10 Claims**

Elements including an image that is opaque to ultraviolet and blue light and is substantially transparent to wavelengths of light over about 500 nm. include a chemical complex of silver with a heterocyclammonium

salt, this complex having the aforementioned optical absorption characteristics. Such elements can be used as photographic mask elements. The complexes can be prepared by reacting a water-insoluble silver salt, preferably when in an image-wise distribution, with an aqueous solution of the heterocyclammonium salt. The complex then forms in regions corresponding to the silver salt distribution. Silver salts that are useful can be prepared in situ by oxidation of a photographic silver image. In one aspect, when a photographic silver image is reacted with a heterocyclammonum salt that is substituted with at least one nitro group and/or is a nitrate salt, the desired complex can be formed without requiring a separate step to oxidize the silver image to the appropriate water-insoluble silver salt.

3,814,606

COLOR PHOTOGRAPHIC PROCESSING COMPOSITION

Mitsuo Ozawa and Yasuhisa Ogawa, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

No Drawing. Filed Jan. 25, 1972, Ser. No. 220,682
Claims priority, application Japan, Jan. 26, 1971, 46/2,558
Int. Cl. G03c *5/30, 7/16*
U.S. Cl. 96—66.1 **3 Claims**

A liquid composition for color photographic liquid processing concentrate comprising

(1) benzyl alcohol or a homolog thereof,
(2) diethylene glycol,
(3) hydroxylamine hydrochloride, and
(4) water.

3,814,607

CRYSTALLINE PHOTOPOLYMERIZABLE COMPOSITIONS WITH IMPROVED STORAGE LIFE

William John Nebe, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1972, Ser. No. 278,459
Int. Cl. G03c *1/70*
U.S. Cl. 96—115 P **11 Claims**

Predominantly crystalline photopolymerizable compositions containing a reducing agent such as 4′-dimethylamino-3-propionyloxybenzophenone have excellent storage life without significant loss of photographic speed.

3,814,608

CONTACT SCREENS

Herbert Middlemiss, Nottingham, England, assignor to Howson-Algraphy Limited, Leeds, England

Filed Mar. 29, 1972, Ser. No. 239,251
Int. Cl. G03f *5/00*
U.S. Cl. 96—116 **6 Claims**

A contact screen having an extended tonal range comprises first and second zones of limiting density, one of the zones being a zone of maximum density and the other of the zones being a zone of minimum density. The screen includes a pattern of crossed lines which constitute one of the zones and which form the boundaries of areas of other densities which include the other of the zones. Each area includes a plurality of dots of different vignetted density arranged around the center of the area. The remaining part of each area has a vignetted density which varies from a value nearer to that of the crossed lines at the center of the remaining part of the area to a value nearer to that of the other zone at a location nearer to the lines forming the boundaries of the area. The contact screen is of use in the photogravure and similar processes and may be a positive-producing screen or a negative-producing screen.

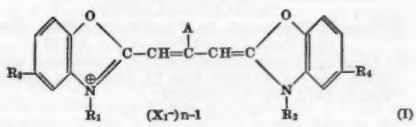
3,814,609

SILVER HALIDE SUPERSENSITIZED PHOTOGRAPHIC EMULSIONS

Keisuke Shiba and Akira Sato, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

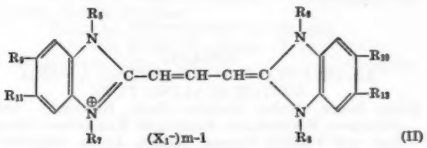
Continuation-in-part of application Ser. No. 276,999, Aug. 1, 1972, which is a continuation-in-part of application Ser. No. 47,702, June 19, 1970, both now abandoned. This application Apr. 25, 1973, Ser. No. 354,421
Claims priority, application Japan, June 19, 1969, 44/48,606
Int. Cl. G03c *1/14*
U.S. Cl. 96—124 **20 Claims**

A silver halide light-sensitive photographic emulsion containing at least one sensitizing dye represented by the following formula I:



(I)

wherein A represents an alkyl group having from 1 to 4 carbon atoms; R_3 represents a halogen atom, a hydroxy group or a phenyl group; R_4 represents a hydrogen atom, a halogen atom, a phenyl group, a hydroxyl group, an alkyl group, or an alkoxy group; R_1 and R_2 each represents an alkyl group or an optionally neutralized sulfoalkyl group; X_1^- represents an acid anion; and n is 1 or 2; said n being 1 when at least one of said R_1 and R_2 is a sulfoalkyl group; and at least one sensitizing dye represented by the following formula II:



(II)

wherein R_5 and R_6 each represents an alkyl group or a substituted alkyl group; R_7 and R_8 each represents an alkyl group, a substituted alkyl group, an optionally neutralized sulfoalkyl group or a substituted alkyl group having an optionally neutralized sulfo group wherein the alkyl moiety thereof is attached to the sulfo group thereof through at least one alkoxyl group or directly connected with a hydroxy group and the sulfo group; at least one of said R_7 and R_8 representing a carbamylalkyl group or said sulfoalkyl group or said substituted alkyl group having a sulfo group; R_9, R_{10}, R_{11} and R_{12} each represents a hydrogen atom, an alkylsulfonyl group; an alkylsulfamoyl group, a N-di-substituted aminosulfonyl group, an alkylcarbamoyl group, a N-di-substituted carbamoyl group, a cyano group, a trifluoromethyl group or a halogen atom; X_1^- represents an acid anion; and m is 1 or 2; m being 1 when at least one of said R_7 and R_8 is the substituent having a sulfo group; at least one of said R_5 and R_6 being said substituted alkyl group or at least one of said R_7 or R_8 being said substituted alkyl group having an optionally neutralized sulfo group when all of said R_9, R_{10}, R_{11} and R_{12} are a hydrogen atom, a halogen atom or mixtures thereof; with the proviso that when said R_3 and R_4 are simultaneously phenyl, said R_9, R_{10}, R_{11} and R_{12} may not simultaneously be hydrogen or chlorine.

3,814,610

POLYMERIC COMPOSITIONS CONTAINING BIS(2,3-DIHALOPROPYL) 2 - CYANO-ALKYLPHOSPHONATES AS FLAME RETARDANTS

Arthur D. F. Toy, Stamford, Conn., and Kenneth I. Eilers, Irvington, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

No Drawing. Original application Sept. 21, 1970, Ser. No. 74,139, now Patent No. 3,745,197. Divided and this application Feb. 23, 1973, Ser. No. 335,406

Int. Cl. C09d *5/18, 3/40*

U.S. Cl. 106—16 6 Claims

The new compounds bis(2,3-dihalopropyl) 2 - cyano-alkylphosphonates are disclosed which have been found to be effective flame retardants for plastics such as polymethyl methacrylate, cellulose acetate, and viscose rayon

---

3,814,611

BERYLLIUM-CONTAINING HIGH ELASTIC MODULUS GLASSES

William H. Dumbaugh, Jr., 6 E. Chatfield Place, Woodland Park, Painted Post, N.Y. 14870

No Drawing. Continuation-in-part of abandoned application Ser. No. 832,468, June 11, 1969. This application Feb. 9, 1972, Ser. No. 224,984

Int. Cl. C03c *3/04*

U.S. Cl. 106—52 1 Claim

This invention relates to transparent glasses exhibiting elastic moduli (Young's moduli) in excess of 17×10^6 p.s.i. and which demonstrate superior resistance to attack by alkalies. More specifically, this invention relates to transparent glasses in the BeO—MgO—Al_2O_3—SiO_2 composition field containing at least one high field strength modifier selected from the group consisting of La_2O_3, TiO_2, Y_2O_3, CaO, Li_2O, and ZrO_2 which can be made into bulk articles, i.e., articles having a thickness dimension of ¼" or greater, with reasonable ease and which, in the form of fibers, are especially useful in reinforcing concrete or gypsum bodies.

3,814,612

GLASS USEFUL FOR FORMING A REED SWITCH SEALING TUBE

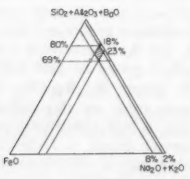
Kozo Inoue, Kobe, Toshito Hara, Kawasaki, Takeo Kitazawa, Sagamihara, Kazuyoshi Yamamoto, Hyogoken, and Toshiro Oguma, Susaka, Japan, assignors to Fujitsu Limited, Kawasaki-shi, Kanagawa-ken, Japan

Filed June 6, 1972, Ser. No. 260,183

Claims priority, application Japan, June 11, 1971, 46/41,561

Int. Cl. C03c *3/103;* H01j *17/18*

U.S. Cl. 106—52 4 Claims



A reed switch sealing glass tube having a thermal expansion coefficient similar to that of the reed strips, substantially no devitrification tendency and an excellent infrared ray absorption is provided by a glass consisting essentially of 58 to 64% of SiO_2, 3 to 5% of Al_2O_3, 11 to 15% of BaO, 18 to 23% of the sum of K_2O and Na_2O and 2 to 8% of FeO by weight.

3,814,613

COKE-OVEN PATCHING MATERIAL

David H. Hubble, Franklin Township, Westmoreland County, and Joseph G. Yount, Jr., Plum Borough, Pa., assignors to United States Steel Corporation

No Drawing. Filed Dec. 21, 1972, Ser. No. 317,504

Int. Cl. C04b *35/14*

U.S. Cl. 106—68 16 Claims

A refractory composition for patching coke oven walls comprises siliceous aggregate, plastic clay, a chemical binder and a source of manganese oxide.

3,814,614

LIGHTWEIGHT STRUCTURAL CONCRETE

Stefan Kraemer, Essen, Michael Seger, Krefeld-Linn, and Alois Seidl, Thurnstein, Post Lam, Germany, assignors to Wasag Chemie GmbH, Munich, Germany

No Drawing. Filed Apr. 25, 1972, Ser. No. 247,381

Claims priority, application Germany, Apr. 28, 1971, P 21 20 775.0

Int. Cl. C04b *7/02, 35/02*

U.S. Cl. 106—97 5 Claims

Structural lightweight concrete having a filler/cement weight ratio of about (350±100):(650±300) and a water/cement weight ratio of about 0.65±0.25, the improvement comprising lightweight fillers comprising:

(a) strongly absorbent, foamed alkali metal silicate glass, concrete compatible products of a smooth unbroken surface, of an approximately spherical or ellipsoidal shape in grain sizes of 0.1–6 mm., preferably 0.1–4.0 mm., and bulk densities of 0.15±0.10 kilograms per cubic decimeter; and

(b) very hard, low absorbent, foamed or bloated or otherwise made porous inorganic lightweight additives in grain sizes of 4–25 mm. and bulk densities of 0.6±0.2 kilograms per cubic decimeter, wherein the volume ratio of (a) to (b) is about 1:9 to 9:1.

3,814,615

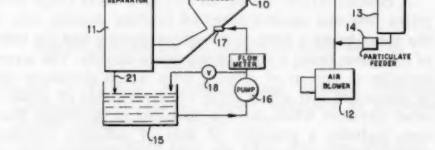
REMOVAL OF PARTICULATE MATTER FROM GASEOUS WASTES BY WET COLLECTORS

Martin Prince, Wayne, N.J., and Hillard Blanck, Floral Park, and Gregorio Tarancon, Astoria, N.Y., assignors to Saleen Development Corp., New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 52,457, July 6, 1970. This application Apr. 26, 1972, Ser. No. 247,526

Int. Cl. C08b *25/02, 27/22*

U.S. Cl. 106—213 12 Claims



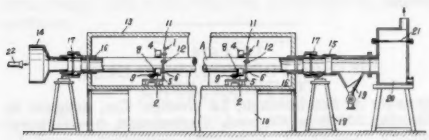
In the removal of particulate matter from gaseous wastes by wet collectors, such as venturi scrubbers, the liquid employed to achieve such removal is water, or an aqueous slurry of the particulate matter, with an additive dissolved therein to substantially improve the collection of the particulate matter thereby, especially when the loading of the gases with such matter is very small. The

additive used has, as its essential constituents, a preferably reactive mixture of an alkyl or dialkyl-phenyl polyethoxy alcohol, an N-substituted acid amide and an ethoxylated fatty alcohol, and one or more starches, preferably also with the addition of a salt.

3,814,616
METHOD FOR COATING THE INNER SURFACE OF METAL PIPES

Taizo Kondo, Keizo Inamura, and Masaaki Kamimura, Hiratsuka, Japan, assignors to Kansai Paint Company Limited, Amagasaki-shi, Hyogo-ken, Japan

Continuation-in-part of abandoned application Ser. No. 863,537, Oct. 3, 1969. This application May 4, 1971, Ser. No. 140,215
Claims priority, application Japan, Oct. 8, 1968, 43/73,381; May 8, 1970, 45/39,606
Int. Cl. B05b *5/02;* **B44d** *1/094*
U.S. Cl. 117—17 **3 Claims**



A method for coating the inner surface of a metal pipe having an inner diameter of 2 to 15 cm. is characterized by heating said metal pipe electrically grounded at a temperature of from a softening point of a coating composition to below a melting point thereof, feeding negatively charged dry particles of a coating composition into the interior of said metal pipe from one end of the pipe and sucking air at the same time from the other end of the metal pipe so as to form an air stream carrying the particles and to allow the particles to deposit electrostatically on the inner surface of the pipe.

3,814,617
PROCESS FOR PRODUCING THE SUPPORT OF A PHOTOGRAPHIC MATERIAL

Tsuneo Kasugai and Nobuhiko Minagawa, Shizuoka, and Masamichi Sato, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed June 9, 1971, Ser. No. 151,521
Claims priority, application Japan, June 17, 1970, 45/52,608
Int. Cl. B44d *1/14;* **G03c** *1/80*
U.S. Cl. 117—34 **10 Claims**

A process for producing a support for use in a photographic material, which comprises providing a subcoat layer containing a resin having an adhesive property with a photographic emulsion and a low molecular weight polyethylene on the surface of a support having a polyolefinic surface, and then heating the subcoat layer, is disclosed.

3,814,618
PRODUCTION OF COLORED COATED GLASS FIBERS

Robert F. Kimpel, Azusa, and Albert Lewis, Covina, Calif., assignors to Kaiser Glass Fiber Corporation, Oakland, Calif.

No Drawing. Filed Oct. 15, 1971, Ser. No. 189,721
Int. Cl. C03c *25/00;* **D06p** *3/80*
U.S. Cl. 117—61 **9 Claims**

Glass fibers coated with polyvinyl acetate are colored by treating such fibers in package form with an aqueous dye solution and involves a method wherein the package is placed in a container and subjected to a vacuum. The dye solution is added, and then pressure is applied to obtain the desired depth of color. A small amount of polyvinyl alcohol is incorporated in the dye solution. The glass package is separated from the dye solution and dried.

3,814,619
PROCESS FOR THE MANUFACTURE OF STRUCTURAL MATERIALS

Sadao Kobayashi, Yokohama, Eiichi Tazawa, Tokyo, Mitsuro Matsunaga, Yokohama, Chikafusa Hoshino, Tokyo, and Hideo Kunisaki, Fujisawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

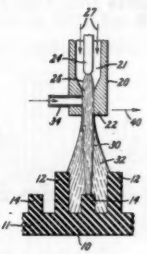
No Drawing. Filed Mar. 5, 1971, Ser. No. 121,528
Claims priority, application Japan, Mar. 9, 1970, 45/19,328; Mar. 30, 1970, 45/25,952; June 13, 1970, 45/50,731; July 10, 1970, 45/60,127
Int. Cl. B44d *1/44*
U.S. Cl. 117—62 **13 Claims**

A process for the manufacture of structural materials for use in the civil engineering and construction work in which a porous base material impregnated with a polymerizable substance or its mixture, optionally together with a specific additive or additives is immersed in a liquid of high viscosity which is substantially non-reactive or immiscible with said polymerizable substance, and the polymerizable substance in the thus-immersed base material is reacted together in the presence of a polymerization catalyst to obtain a structural material containing a reaction product of the polymerizable substance integrally incorporated with the base material.

3,814,620
METHOD OF APPLYING A FUSED SILICA COATING TO A SUBSTRATE

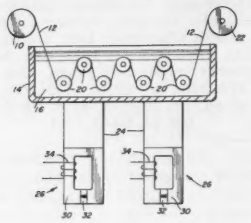
Cecil Bailey, Woodlyn, and Walter C. Balchunas, Linfield, Pa., and John E. Zlupko, Delran, N.J., assignors to General Electric Company

Filed Oct. 18, 1971, Ser. No. 190,190
Int. Cl. B05b *7/22;* **H01h** *33/08*
U.S. Cl. 117—93.1 PF **4 Claims**



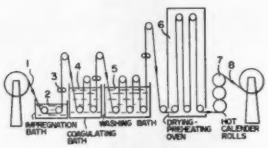
Discloses a method of applying an amorphous fused silica coating to a substrate of refractory non-metallic material. High temperature arc plasma from an arc plasma spray gun is projected onto the substrate surface; and particles of a material consisting essentially of crystalline silica are fed into the plasma, where they are melted and entrained in the plasma. The gun is held close enough to the substrate to effect melting of the surface of the substrate, or the previously-applied material, in the region where the molten drops of silica entrained in the plasma are impinging against said surface.

3,814,621
METHODS OF AND MEANS FOR COATING ARTICLES EMPLOYING SONIC ENERGY
Frank Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.
Application Oct. 24, 1969, Ser. No. 869,282, now Patent No. 3,685,487, which is a continuation of abandoned application Ser. No. 614,604, Feb. 8, 1967. Divided and this application Jan. 26, 1972, Ser. No. 221,110
Int. Cl. C23c 1/04
U.S. Cl. 117—114 B 2 Claims



A coating or tinning is applied to an aluminum wire by a continuous manufacturing process. The wire is immersed in and drawn through a sonically activated bath of a molten zinc-tin alloy. The sonic activity removes the surface oxide and enables the tinning material to adhere to the aluminum surface.

3,814,622
SYNTHETIC INSULATING PAPER FOR ELECTRIC INSULATION
Setsuya Isshiki, Funabashi, Shiro Nakayama, Yachiyo, and Kuniyuki Nakayama, Tokyo, Japan, assignors to The Fujikura Cable Works Limited, Tokyo, Japan
Filed Nov. 25, 1970, Ser. No. 92,804
Claims priority, application Japan, Nov. 29, 1969, 44/95,482; Dec. 30, 1969, 45/105,488; Feb. 6, 1970, 45/10,033; Apr. 20, 1970, 45/32,968; May 6, 1970, 45/37,928; June 10, 1970, 45/49,506; June 15, 1970, 45/51,052; Aug. 19, 1970, 45/72,069, 45/72,070
Int. Cl. H01b 3/02, 3/08, 3/20
U.S. Cl. 117—126 AB 1 Claim



A synthetic insulating paper for use in electrical insulation upon impregnation with an insulating fluid, said paper comprising a sheet consisting of a fibrous substrate and a matrix polymer uniformly distributed therein, said sheet being prepared by impregnating a porous, fibrous web or sheet material with a solution of a high-molecular-weight organic polymer at a rate such that the amount of said high-molecular-weight organic polymer is 5 to 70% by weight based on said web or sheet material, precipitating and coagulating said organic polymer three-dimensionally on said web or sheet and thereafter subjecting the treated web or sheet to calendering under pressure, said sheet having uniform fine voids with a void ratio in the range of 10 to 70%.

3,814,623
POLYESTER FABRICS COATED WITH ETHYLENE COPOLYMER DISPERSIONS
Boni Philip Martinez, Wilmington, Del., and Gerfried Pruckmayr, Media, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Original application Feb. 16, 1970, Ser. No. 11,869. Divided and this application Dec. 16, 1971, Ser. No. 208,919
Int. Cl. C09d 5/18
U.S. Cl. 117—135.5 6 Claims

An aqueous dispersion of an ethylene copolymer, a halogenated alkyl phosphate and, optionally, a finely divided particulate matter filler is proxided. The dispersion contains as essential ingredients (1) about 20 to 95 percent by weight of an ethylene copolymer such as ethylene/vinyl acetate copolymer or an ethylene/methacrylate acid ionomer copolymer, (2) 0 to about 25 percent by weight of a filler, and (3) about 5 to 80 percent by weight of a halogenated alkyl phosphate such as tris-(2,3-dibromopropyl) phosphate. Polyester fabrics are rendered rainproof and fire-retardant when coated with particular dispersions.

3,814,624
METHOD FOR PREPARING DUST CONTROL FABRICS
Alexander A. Scarborough, La Grange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
No Drawing. Original application Jan. 29, 1970, Ser. No. 6,972, now Patent No. 3,695,926. Divided and this application Mar. 30, 1972, Ser. No. 239,815
Int. Cl. B44d 1/06; C09k 3/28
U.S. Cl. 117—136 5 Claims

Emulsifiable flame retarding compositions for preparing dust control fabrics are disclosed. The compositions comprise an oil having a flash point above about 150° C., a flame retarding organic phosphate ester and emulsifying agent. These compositions readily form aqueous emulsions from which the oil composition is exhausted onto dust control fabrics such as cloths and mops. Such treated dust control fabrics exhibit improved flame retardancy and dust collecting properties.

3,814,625
FORMATION OF TUNGSTEN AND MOLYBDENUM CARBIDES
Ronald Harvey Lewin, Beaconsfield, and Cecil Hayman, Rickmansworth, England, assignors to Fulmer Research Institute Limited, Buckinghamshire, England
No Drawing. Filed Oct. 6, 1971, Ser. No. 187,194
Claims priority, application Great Britain, Oct. 8, 1970, 47,981/70
Int. Cl. C23c 11/08
U.S. Cl. 117—71 M 9 Claims

The invention is for methods for the formation of tungsten and molybdenum carbides or mixtures thereof, the method comprising effecting a vapour phase chemical interaction between (1) a metal hexafluoride wherein the metal is selected from the groups consisting of tungsten, molybdenum and mixtures thereof, (2) a reactable hydrocarbon and (3) hydrogen, said interaction being effected at reaction temperatures between 400° C. and 1000° C. and with a carbon to hydrogen ratio in the mixture sufficiently low to ensure substantially no carbon is deposited as the required carbide is formed. The method is generally effected at reaction temperatures between 500° C. and 900° C. It is preferred that the reaction mixture consists of tungsten hexafluoride, benzene, toluene or xylene and hydrogen. The hydrocarbon however may be any one of a wide range of hydrocarbons that are vaporisable at the reaction temperatures and which will undergo reaction with the other components to produce the required car-

bide. By the method of the invention the carbide, especially tungsten carbide, can be applied to a wide variety of substrates such as the working surface of a steel tool or bearing or on carbon or boron fibres.

3,814,626

CORE BOX

Lloyd H. Brown and Larry C. Stephans, Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Original application May 8, 1970, Ser. No. 35,902, now Patent No. 3,692,085. Divided and this application Jan. 17, 1972, Ser. No. 218,627

Int. Cl. B29c 1/06; B32b 27/08
U.S. Cl. 117—138.8 A **1 Claim**

A core box formed of a urea-formaldehyde-gamma amino propyl triethoxy silane-furfuryl alcohol thermosetting resin which is substantially lossless to microwave energy coated with a coating which is lossless to microwave energy, such as polyethylene, polypropylene, or polyurethane.

3,814,627

POLYESTER YARN

Robert Moore Marshall and Sung Kun Pak, Chester, and Kimon Constantine Dardoufas, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 21, 1972, Ser. No. 219,900

Int. Cl. B32b 27/02, 27/16
U.S. Cl. 117—138.8 F **1 Claim**

An improved polyester yarn is prepared by applying to the yarn a finish composition comprising an aqueous dispersion of colloidal silica and a polyethylene glycol ester of a C_6 to C_{18} aliphatic acid, said polyethylene glycol having a molecular weight of about 200 to 600.

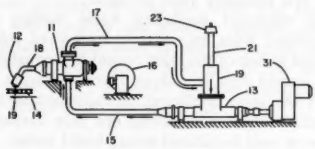
3,814,628

BATTERY PASTE PUMPING AND METERING SYSTEM

Terrance M. Larkin, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Apr. 17, 1972, Ser. No. 244,485

Int. Cl. B44c 1/18; H01m 35/00
U.S. Cl. 117—201 **7 Claims**



A closed loop pumping and metering system for pasting battery electrode plates with a viscous, thixotropic battery paste is disclosed. The closed loop includes an inlet for charging make-up paste, a first pump for agitating and circulating the paste around the loop, and a metering pump downstream of the circulating pump for initiating flow of a predetermined volumetric flow rate of paste through a discharge means onto a battery grid substrate, or the like. The paste consistency and working life are enhanced by the mixing effect provided by repeated passes through the circulating and metering pumps.

3,814,629

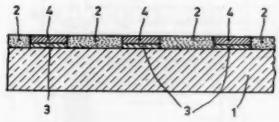
METHOD OF MANUFACTURING A LUMINESCENT SCREEN OF A COLOR TELEVISION DISPLAY TUBE

Norbert Ernst Fritz Hansen, Roetgen, and Walter Fritz Konrad Littmann, Eildendorf, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 21, 1971, Ser. No. 182,492

Claims priority, application Germany, Sept. 25, 1970, P 20 47 262.2

Int. Cl. G03g 7/00, 13/04, 13/22
U.S. Cl. 117—211 **9 Claims**



A method of manufacturing a luminescent screen of a cathode-ray tube for displaying colored pictures. The luminescent areas of the screen are separated by light absorbing areas. The luminescent areas are applied by means of any method previous to the application of the light absorbing areas which are applied by means of electrostatic deposition. For the electrostatic deposition of the light absorbing areas a conductive layer and a dielectric layer are formed in the intermediate spaces between the luminescent areas. The layers are formed by means of rinsing with dilute, i.e., low viscosity, solutions by which the formation of the layers on the luminescent areas is impeded.

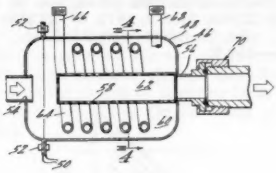
3,814,630

FILTER/STORE FOR ELECTRIC ENERGY STORAGE DEVICE

Harry K. Bjorkman, Jr., Birmingham, Mich., assignor to Occidental Energy Development Company, Madison Heights, Mich.

Filed Nov. 18, 1971, Ser. No. 200,066

Int. Cl. H01m 27/14, 29/04
U.S. Cl. 136—86 A **9 Claims**



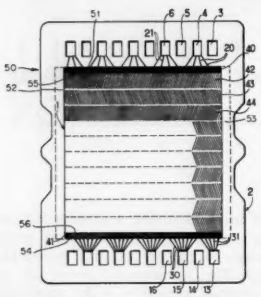
An electrical energy storage battery comprising an electrolytic cell through which an aqueous electrolyte is circulated and which is connected to a storage chamber having a filter therein for filtering and storing a supply of halogen hydrate. The halogen hydrate is adapted to progressively decompose during the electrical discharge of the storage battery, effecting thereby a replenishment of the quantity of halogen consumed in the electrolytic cell.

3,814,631

FRAMED ELECTRODES CONTAINING MEANS FOR SUPPLYING OR DRAINING LIQUID ALONG THE EDGE OF AN ELECTRODE

Bernard Warszawski, Paris, Bernard Verger, Essonne, and Philippe Demange, Chatenay-Malabry, France, assignors to Society Generale de Constructions Electriques et Mechaniques (Alsthom), Paris, France

Filed Feb. 15, 1972, Ser. No. 226,502
Claims priority, application France, Feb. 15, 1971, 5,117
Int. Cl. H01m *35/00, 27/04*
U.S. Cl. 136—860 12 Claims



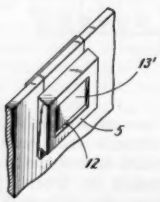
A framed electrode having a flat frame around a thin sheet electrode. The frame contains supply orifices in one side and drainage orifices in another side. The supply orifices and preferably also the drainage orifices communicate with the surface of the electrode through a plurality of micro-channels. A plurality of micro-channels diverge from each of said orifices toward the side of the electrode. Preferably the micro-channels diverging from a given orifice are symmetrically positioned. The micro-channels are preferably separated from the side of the electrode toward which they lead by a fluid distribution area positioned therebetween. The fluid distribution area contains a plurality of spaced projections.

3,814,632

BATTERY AND METHOD OF MANUFACTURING THE SAME

Shiro Miyagawa, Suita, Osaka, Japan, assignor to Miyagawa Kasei Industry Co., Ltd.

Filed Apr. 20, 1972, Ser. No. 245,735
Claims priority, application Japan, Apr. 20, 1971, 46/25,966; Mar. 7, 1972, 47/23,282
Int. Cl. H01m *5/00, 35/32*
U.S. Cl. 136—134 R 13 Claims



A storage battery case of synthetic resin in prepared which has a plurality of partition walls for forming cells therein, each wall having a notch formed at its upper end portion. Into each notch is inserted a connector member so that opposite sides may face the respective cell. Then mold elements are brought into a position near the connector member to form an enclosed space around the peripheral portion of the connector member. Synthetic resin is then injected into the space to form a seal member so that at least a portion of the sides of the connector member facing the cell may be exposed. Then into each cell is inserted an electrode plate assembly, which has an electrode rod extending upward from an end thereof up to the connector member. In the next step, the upper ends of both electrode rods of the adjacent assemblies are connected to the connector member by means of electrical welding, for example.

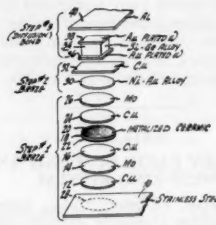
A battery case cover also made of synthetic resin is thermally bonded on the battery case so that each cell is isolated from each other. As a result a good liquid-tight effect of the connector extending through the partition wall in the battery is attainable with ease.

3,814,633

THERMO-ELECTRIC MODULAR STRUCTURE AND METHOD OF MAKING SAME

Norman S. Freedman, Berkeley Heights, Carel W. Horsting, Caldwell, Walter F. Lawrence, Verona, and John J. Carrona, Scotch Plains, N.J., assignors to Radio Corporation of America

Filed Dec. 26, 1961, Ser. No. 162,281
Int. Cl. H01v *1/30*
U.S. Cl. 136—205 14 Claims



1. A thermoelectric module adapted to be fixed to a heated body, said module comprising

(a) a first equalizer sheet of metal,

(b) an electrical insulating wafer having opposite metallized sides, one of said metallized sides being brazed to one of the sides of said first equalizer sheet,

(c) a second equalizer sheet of metal having substantially the same coefficient of expansion as said first equalizer sheet and having one side brazed to the other of said metallized sides of said wafer,

(d) a hot-junction connecting member having one side brazed to the other side of said second equalizer sheet,

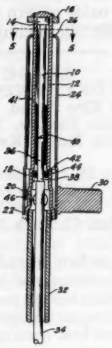
(e) a thermoelectric element having hot and cold junction shoes,

(f) means bonding said hot junction shoe of said thermoelectric element to the other side of said hot-junction connecting member,

(g) a cold-junction connecting member, and

(h) means bonding one side of said cold-junction connecting member to said cold junction shoe of said thermoelectric element.

3,814,634
COMBINED PILOT BURNER AND THERMOCOUPLE DEVICE
Richard A. Burket, Thomas P. Fleer, and Carl A. Smith, St. Louis County, and John J. Love, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Sept. 11, 1972, Ser. No. 287,609
Int. Cl. H01v *1/02*
U.S. Cl. 136—218 9 Claims

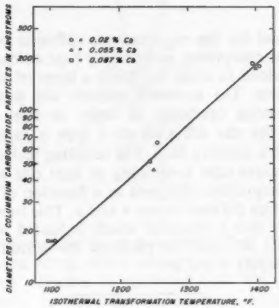


A combined pilot burner and thermocouple unit comprising a chrome-steel tube element and a shorter nickel-copper rod element arranged coaxially therein and welded together at their outer ends to form a hot junction. The inner ends of the thermocouple tube and rod elements are suitably joined, respectively, end-to-end with a conductive metal tube and a coaxial conductive wire coextending with the tube to a remote gas control valve and to an electromagnet housed therein as gas supply conduit means and as electrical conduction means. A larger diameter burner tube surrounding and coextending with the chrome-steel tube element has a burner port at its outer end adjacent the hot thermocouple junction and is closed at its inner end around the chrome-steel tube element. An aperture in the wall of the chrome-steel tube element near its inner end permits the flow of gas from the conductive metal tube to the burner tube, and a fluid-tight seal in the chrome-steel tube element between the aperture and inner end of the shorter nickel-copper rod element excludes gas from that portion of the tube within which this element extends. Connector means at the remote ends of the conductive tube and wire provide a fluid-tight connection of the tube with a gas passage in the gas body and electrical connection with an electromagnet house therein.

3,814,635
PRODUCTION OF POWDER ALLOY PRODUCTS
Dante James Cometto, Huntington, W. Va., Jeremy Painter Morse, Chesapeake, Ohio, and Robert Edward Crickmer and Irvin Kirk, Huntington, W. Va., assignors to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed Jan. 17, 1973, Ser. No. 324,313
Int. Cl. C22f *1/00, 1/10, 1/11*
U.S. Cl. 148—11.5 R 13 Claims

Method of producing dispersion strengthened superalloys having improved high stress-rupture properties at elevated temperatures wherein a powder metallurgy product processed so as to eliminate fine grains, is hot worked to produce a metallurgical structure characterized by coarse, elongated grains.

3,814,636
METHOD FOR PRODUCTION OF LOW CARBON STEEL WITH HIGH DRAWABILITY AND RETARDED AGING CHARACTERISTICS
Peter R. Mould, Franklin Township, Westmoreland County, and John M. Gray, Peters Township, Washington County, Pa., assignors to United States Steel Corporation
Filed Mar. 2, 1972, Ser. No. 231,325
Int. Cl. C21d *1/18*
U.S. Cl. 148—12.1 13 Claims


o = 0.02 % Cb
x = 0.055 % Cb
□ = 0.097 % Cb
DIAMETERS OF COLUMBIUM CARBONITRIDE PARTICLES IN ANGSTROMS
ISOTHERMAL TRANSFORMATION TEMPERATURE, °F.

A sheet steel with exceptionally high drawability and retarded aging characteristics is produced by adjusting the melt to less than 0.50% Mn, 0.002 to 0.06% C, less than 150 p.p.m. oxygen and adding Cb to combine with the C and N present in the melt. The slab cast from the melt is then hot rolled above the A_3 temperature and heat-treated to produce a critical coarse dispersion of carbonitrides. The resultant sheet is then cold reduced from 50 to 90% and soaked at temperatures within the range 1200° F. to the ferrite to austenite transformation temperature of the steel to develop desired crystallographic textures.

3,814,637
LOW SMOKE CRYSTAL FLUX
Peter H. Scott, Sudbury, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.
No Drawing. Filed Jan. 22, 1973, Ser. No. 325,533
Int. Cl. B23k *35/34*
U.S. Cl. 148—23 4 Claims

Zinc chloride-ammonium chloride type fluxes containing finely divided magnesium silicate and having a long pot life and low smoke emission characteristics have been devised for use on the surface of soldering baths from which molten solder is flowed into the side seam of metal container bodies.

3,814,638
SOLDERING FLUXES
David Paul Jordan, Warwick, and Laird Gordon Lindsay Ward, Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed May 5, 1972, Ser. No. 250,524
Int. Cl. B23k *35/34*
U.S. Cl. 148—23 7 Claims

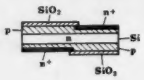
Soldering fluxes which have an activity suitable for use in soldering nickel and nickel alloys as well as copper and copper alloys and which are extremely non-corrosive. The fluxes comprise a polymeric imine and a small amount of a chelating agent such as 8-hydroxyquinoline.

3,814,639

METHOD FOR THE SIMULTANEOUS DIFFUSION OF IMPURITIES IN SILICON AND SEMICONDUCTOR DEVICES RESULTING FROM IT

Guy Dumas, Paris, France, assignor to Societe Anonyme Silec-Semi-Conducteurs, Paris, France

Filed Sept. 17, 1971, Ser. No. 181,500
Claims priority, application France, Dec. 7, 1970, 7043900
Int. Cl. H01l 7/44
U.S. Cl. 148—187 10 Claims



A method for the simultaneous diffusion of impurities into silicon comprising performing heat oxidation on sections of silicon in order to obtain a layer of silca SiO_2 on each section. The oxidized sections are subjected to a photoengraving operation in order to open "windows" necessary for the diffusion of a type *n* layer and then passed into a cleaning bath. The resulting sections are lined up in a quartz tube containing at least one source of at least two impurities, designed as a function of the desired structure with diffused layers *n* and *p*. This tube is charged and placed into a chamber which is heated to a suitable temperature in order to perform the simultaneous diffusion of layers *n* and *p*.

3,814,640

PROCESS FOR PREPARING COMPOSITE SILVER-CADMIUM OXIDE ALLOY CONTACT WITH SILVER-CADMIUM SURFACE

Akira Shibata, Tokyo, Japan, assignor to Chugai Electric Industrial Co., Ltd., Tokyo, Japan

Original application Feb. 8, 1971, Ser. No. 113,541, now Patent No. 3,688,067. Divided and this application Apr. 10, 1972, Ser. No. 242,859
Int. Cl. C23f 7/02; H01h 1/02
U.S. Cl. 148—6.3 2 Claims

A composite electric contact comprising a silver-cadmium oxide alloy as the contact material or element and having a silver-cadmium layer integrally formed on the face opposite to the contact face is prepared by applying an anti-oxidant layer to the contact-forming face, oxidizing the contact material with an oxidizing atmosphere, then reducing the oxidized face to form an integral silver-cadmium layer on the face opposite said contact-forming face and then removing the anti-oxidant layer.

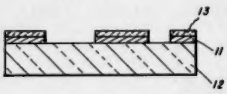
3,814,641

PROCESS OF FABRICATING SILICON PHOTOMASK

Alan R. Reinberg, Dallas, and John G. Fish, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 20, 1972, Ser. No. 273,560
Int. Cl. H01l 7/50
U.S. Cl. 156—11 7 Claims

An improved "see-through" photomask of silicon patterned on glass is produced by the low-temperature deposition of silicon, followed by the low-temperature deposition of silicon nitride or silicon oxide on the silicon. The nitride or oxide is then patterned by selective etching for use as an etch-resistant mask in the selective



etching of the silicon to produce the photomask. Preferably, the nitride or oxide pattern is left on the silicon pattern as an anti-reflection coating.

3,814,642

MANUFACTURE OF CARBON SHAPED ARTICLES

Tadashi Araki and Kiro Asano, Tokyo, Junichi Kosugi, Urawa, and Fumio Tamura, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 28, 1971, Ser. No. 212,966
Claims priority, application Japan, Dec. 29, 1970, 46/120,978, 46/120,979
Int. Cl. B32b 31/00
U.S. Cl. 156—60 5 Claims

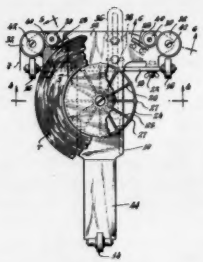
Manufacture of carbon shaped article having gas impermeability, high hardness, and high mechanical strength by mixing organic fiber having particular physical properties with organic binder, or a mixture of the organic binder and an aggregate, and heat-treating the mixed material.

3,814,643

METHOD OF APPLYING TAPE

Walter Wagner, 2 Spring Drive, Dumont, N.J. 07628

Continuation-in-part of application Ser. No. 33,546, May 1, 1970, now Patent No. 3,677,865, dated July 18, 1972. This application May 22, 1972, Ser. No. 255,658
Int. Cl. E04b 2/00
U.S. Cl. 156—71 8 Claims



Masking tape is applied along an edge of one surface by moving a tape roll carrying carriage over an adjacent angularly related surface, either by hand or with an extension handle adapted to be demountably connected to the carriage to provide universal angular movement of the handle relative to the carriage and to coact with a guide and abutment member extending laterally from the carriage to the surface on which the tape is to be applied.

3,814,644

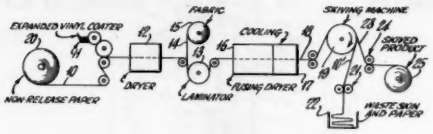
PROCESSING OF EXPANDED-PLASTIC SHEET MATERIAL

Albert E. Anderson, Norwich, Conn., assignor to Pervel Industries, Inc., Plainfield, Conn.

Filed Sept. 16, 1971, Ser. No. 181,113
Int. Cl. B32b 31/18
U.S. Cl. 156—78 16 Claims

The invention contemplates processing of expanded-plastic sheet material to produce a velvet-like texture on

one face, by an improved technique of heat-skiving. In one embodiment, the expanded-sheet material is initially cast upon a non-release sheet, as of paper, and after the expanded-plastic has been cured, the non-release sheet is pulled from the main body of the expanded-plastic material, removing the skin layer of the expanded sheet with the removed non-release sheet, and thereby exposing a valvet-like surface on the remaining expanded-plastic material; loss of expanded plastic is minimized by careful control of a thermal gradient through the thickness of the plastic to assure local weakening at a stratum of expanded material adjacent the bond to the non-release sheet. In another embodiment, expanded plastic sheeting, taken from inventory, is laminated with non-release sheeting, so that the skin of the inventoried material can be removed by the same "heat-skiving" technique.



3,814,645

METHOD OF REPAIRING DISCONTINUITY IN FIBERGLASS STRUCTURES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Leonard L. Gelb, Wilmington, Del., William B. Helbert, Jr., Radford, Va., Ronald B. Enie, State College, Pa., and Richard F. Mulliken, Yorktown, Va.

Filed May 9, 1972, Ser. No. 251,752

Int. Cl. B32b *35/00*

U.S. Cl. 156—94 **8 Claims**

Damaged fiberglass structures are repaired by substantially filling the irregular surfaced damaged area with a liquid, self-curing resin, preferably an epoxy resin mixed with choped fiberglass, and then applying to the resin surface the first of several woven fiberglass swatches which has stitching in a zig-zag pattern parallel to each of its edges and a fringe of warp and fill glass fibers about the edges outward of the stitching, coating the applied swatch with the liquid, self-curing resin, and applying additional swatches in a similar manner, each of a larger dimension than the preceding swatch in a manner to overlap a portion of the fringe of adjacent swatches, until the fiberglass swatch and resin composite that is formed covers the area to be repaired, and allowing the resin to cure. The method is especially applicable to repair of fiberglass rocket engine casings and is particularly advantageous since it restores the repaired fiberglass structure to substantially its original strength without any significant changes in the geometry or mass of the structure.

3,814,646

METHOD AND APPARATUS FOR JACKETING A STEEL PIPE

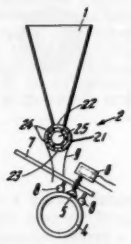
Walter Meyer, Rumeln, and Walter Quitmann, Angermund, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 29, 1972, Ser. No. 239,059

Claims priority, application Germany, Apr. 5, 1971, P 21 16 618.1

Int. Cl. B65h *81/00*

U.S. Cl. 156—195 **8 Claims**



In a method of lining or jacketing a steel pipe having a welding seam along which surface uneveness occurs and whereby an adhesive is provided onto the pipe and a thermoplastic is extruded to form a strip which is helically wound onto the steel pipe for adherence thereto, the pipe turning on its axis while moving axially for the strip winding; the seam is stepwise covered with plastic for smooth interfacing with the strip.

3,814,647

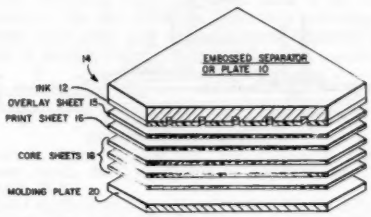
HIGH PRESSURE DECORATIVE LAMINATE WITH INK SURFACE REGISTERED WITH EMBOSSING

Herbert I. Scher and Israel S. Ungar, Randallstown, and John E. McQuade, Jr., Baltimore, Md., assignors to Esso Research and Engineering Company

Filed May 24, 1972, Ser. No. 256,455

Int. Cl. B32b *31/04, 31/12, 31/22*

U.S. Cl. 156—219 **4 Claims**



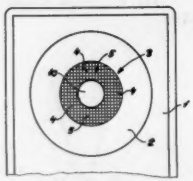
A decorative high pressure laminate meeting NEMA standards and having registered color and embossing with a thermosetting ink forming at least a portion of the upper surface is produced by printing a filled, pigmented, thermosetting ink in a design in registry with an embossed molding surface. The ink layer is partially cured and the composite is used to emboss a high pressure laminate, the transferred ink laminating and solidifying to a hard intractable mass.

3,814,648

METHOD OF MANUFACTURING A COLOSTOMY, ILEOSTOMY OR URETEROSTOMY BAG

Arne Brondberg, Sovej 4, DK–3490 Kvistgaard, Denmark

Filed June 20, 1972, Ser. No. 264,665
Claims priority, application Denmark, June 30, 1971, 3,220/71
Int. Cl. B32b *31/18*
U.S. Cl. 156—253 2 Claims



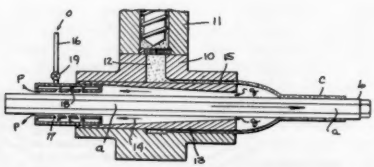
A method of manufacturing a colostomy, ileostomy or ureterostomy bag of the type comprising an adhesive disc provided with a central opening and welded to the bag so that the entrance opening of the bag is concentric with the opening in the disc, characterized in that the adhesive disc is welded to the continuous wall of the bag over a wide annular zone of closely spaced shuts and that an entrance opening of the desired dimensions is then punched in the bag wall and the adhesive disc simultaneously.

3,814,649

APPARATUS FOR COVERING ELONGATE MEMBERS

Takao Yamaoka, Toyonaka, Osaka, and Osamu Sasaki and Takashi Yamana, Hirataka, Osaka, Japan, assignors to Sekisui Jushi Kabushiki Kaisha, Tamai-cho, Kita-ku, Osaka-shi, Japan

Continuation-in-part of abandoned application Ser. No. 821,274, May 2, 1969. This application Dec. 23, 1971, Ser. No. 211,470
Claims priority, application Japan, Sept. 17, 1968, 43/67,492; Oct. 21, 1968, 43/92,042
Int. Cl. B29b *5/00*; B29c *17/00*; B29f *3/03*
U.S. Cl. 156—463 1 Claim



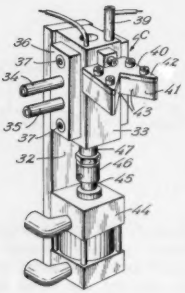
Method and apparatus for covering a rigid elongate member of indefinitely continuous length by adhesively applying a tape to said member, advancing the member through a tapered, apertured throttle means, applying pressure to the tape, passing the taped member through a passage in a mandrel contained in a die, passing synthetic resin through a separate passage in the die, while withdrawing air contained in a gap formed between the extruded resin and the elongate member outside the die, and causing a tight contact between the extruded resin and the member with the tape thereon outside the die.

3,814,650

EXTRUDER HEAD FOR SEALING CONTAINERS

Raymond S. Dick, Minneapolis, and Loren J. Klitzke, Edina, Minn., assignors to Hoerner Waldorf Corporation, Ramsey, Minn.

Filed Dec. 23, 1971, Ser. No. 211,303
Int. Cl. B31b *1/62*
U.S. Cl. 156—500 5 Claims



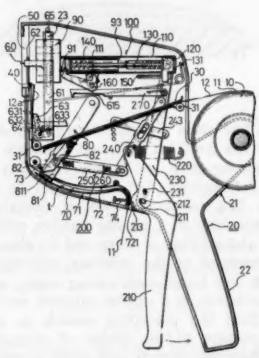
A carton having tubularly arranged walls and at least one end closure including closure flaps connected said walls and secured in face contact is sealed along the edges of the closure flaps by an extruder head having right angular faces designed to extend along a surface of the closure flaps and the adjoining carton wall. The extruder head includes an an extrusion slot at the juncture of said faces extruded.

3,814,651

LABELER

Tokio Wada, Tokyo, Japan, assignor to Shinsei Industries Co., Ltd., Tokyo, Japan

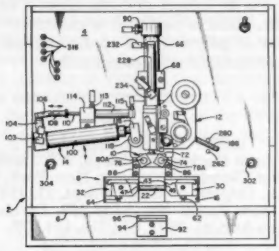
Filed May 31, 1972, Ser. No. 258,247
Claims priority, application Japan, June 5, 1971, 46/47,206
Int. Cl. B65c *9/18*
U.S. Cl. 156—541 16 Claims



A labeler wherein a label carrying tape on which a plurality of labels are adhered in succession with small intervals is folded by a label returning part to turn back at a label hammer-out opening so that a label is detached from the tape to project into a space formed in said

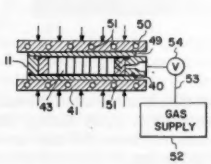
opening. The detached label is retained by the label holders which are moved in the feeding direction along with movement of the tape and the label is hammered out for affixing when it comes to a specified position.

3,814,652
TAPE SPLICING METHOD AND MACHINE
James L. King, Sudbury, Mass., assignor to King Instrument Corporation, Hudson, Mass.
Filed Oct. 4, 1972, Ser. No. 294,970
Int. Cl. B31f *5/00*
U.S. Cl. 156—159 **17 Claims**



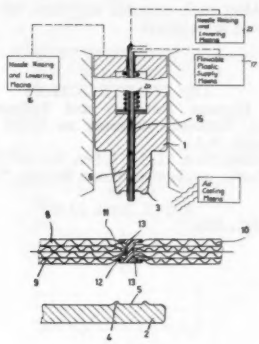
A machine for tailoring and splicing together the end portions of two sections of magnetic tape. It includes two moveable splicing blocks adapted to support the two sections of tape, cutter means operative when the splicing blocks are spaced a predetermined distance for severing the end portions of the two tape sections so as to provide tailored ends suitable for splicing, means for moving the splicing blocks together so as to place the tailored ends of the two tape sections in abutting relation, and means for applying a piece of adhesive splicing tape onto the two tape sections in overlapping relation to their tailored ends and for pressing the piece of splicing tape into firm adherence with the two tape sections so as to form a strong splice.

3,814,653
METHOD OF LAMINATING STRUCTURAL MEMBERS
Wilbur C. Heier, Hampton, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Jan. 20, 1972, Ser. No. 219,435
Int. Cl. B32c *11/00*
U.S. Cl. 156—285 **10 Claims**



A laminate is provided by providing a lightweight core material, such as a honeycombed plastic, metal, or the like, within the cavity defined by an annular mold cavity frame. Face sheets, which are to be bonded to the core material, are provided on opposite sides of the frame and extend over the frame thus sealing the core material in the cavity. An adhesive is provided between the core material and the face sheets and the combined thickness of the core material and adhesive is a close fit within the opposed face sheets. A gas tight seal, such as an O-ring gasket, is provided between the frame and the face sheet members to form a gas tight cavity between the face sheet members and the frame. External heat and pressure are used to bond the face sheets to the core material. Gas pressure is introduced into the sealed cavity to minimize out-gasing of the adhesive.

3,814,654
METHOD TO CONNECT CARDBOARD, PAPER OR THE LIKE
Walter Kugel, Pluderhausen, Germany, assignor to Wilhelm Bahmuller, Pluderhausen, Germany
Filed Dec. 1, 1971, Ser. No. 203,639
Claims priority, application Germany, Dec. 11, 1970, P 20 61 064.4
Int. Cl. B32b *31/00*; B29d *3/00*
U.S. Cl. 156—290 **7 Claims**

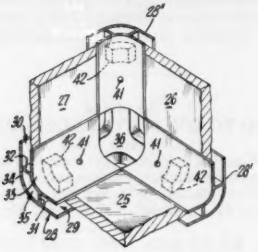


Method for connecting flat parts formed of cardboard and especially corrugated cardboard, or the like, by means of plastic material whereby the two flat parts to be connected are overlaid and flowable liquid plastic material is forced through the overlaid parts to form a plastic stem which extends through the overlaid parts. The plastic is forced through with sufficient pressure so as to form extensions extending from the plastic stem in the lateral direction of the flat parts, the extensions extending also between said parts, and then the plastic material is allowed to harden, thereby securing said parts together.

3,814,655
BONDING TECHNIQUE
Robert L. Weill, Naples, Fla., and George B. Parsons, Port Jervis, N.Y., assignors to Skydyne, Inc., Port Jervis, N.Y.
Original application Nov. 23, 1970, Ser. No. 91,819, now Patent No. 3,716,259. Divided and this application Oct. 10, 1972, Ser. No. 296,240
Int. Cl. B32b *31/00*
U.S. Cl. 156—293 **7 Claims**

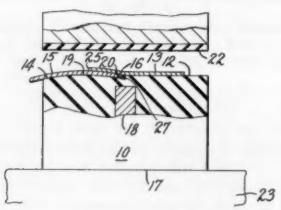
The invention contemplates a bonded assembly of plural parts having regions of channel-socket or telescoping fit with each other. One or more small apertures are provided to vent the overlap region of such fit, and the aperture assists in the pressurized liquid-phase introduction of hardenable bonding material. Depending upon the nature of the assembly or joint, (a) the parts may be fabricated to naturally and substantially close or dam the

open annulus attributable to clearance between the overlapped parts at the open end of the region of overlap, or (b) expendable rings or solid plugs may be used to



confine to the overlap region the flow of injected bonding material. After such injection and flow, the bonding material is cured to hardness.

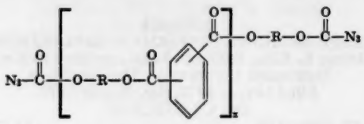
3,814,656
DIE CONSTRUCTION
Raymond Hanson, Rearsby, and Sydney A. Vinter, Leicester, England, assignors to USM Corporation, Flemington, N.J.
Filed Nov. 11, 1971, Ser. No. 197,781
Claims priority, application Great Britain, Nov. 13, 1970, 54,085/70
Int. Cl. B32b *31/00*
U.S. Cl. 156—380 **5 Claims**



A die for operating on workpieces has first and second workpiece supporting surfaces opposed edges of which are in stepped relation to each other for supporting the workpieces in overlapping relation. A shoulder joins the edges of the surfaces for limiting the overlapping relation of the workpieces and a ridge in the one of the surfaces supporting an overlapped workpiece runs substantially parallel to the shoulder to urge workpiece material toward the shoulder.

3,814,657
AZIDOFORMATES AND THEIR USE
James N. Haynes, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 93,399, Nov. 27, 1970, now Patent No. 3,686,231, which is a continuation-in-part of abandoned application Ser. No. 887,382, Dec. 22, 1969. This application Mar. 3, 1972, Ser. No. 231,741
Int. Cl. B32b *27/06*
U.S. Cl. 161—144 **8 Claims**

Disclosed is a process of improving the adhesion of polyester material to various other materials using the azidoformates of omega-hydroxyalkyl phthalates, their related low molecular weight condensation polymers and their mixtures represented by the general formula

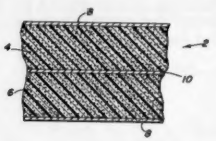


where R is an alkylene radical containing 2 to 10 carbon atoms and x is an integer of from about 1 to about 10. In particular, there is disclosed a process of improving the adhesion of polyester tire cord to rubber tire stock using the said azidoformate compounds.

3,814,658
COMPOSITE LAMINATE
Donald Leon Decker, Newburgh, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Original application Sept. 11, 1967, Ser. No. 666,941, now Patent No. 3,652,359. Divided and this application Aug. 31, 1971, Ser. No. 176,677
Int. Cl. D03d *3/00, 7/00*
U.S. Cl. 161—77 **2 Claims**

A process for molding an article of manufacture consisting of forming a laminate composed of a stretch fabric bonded to stretchable plastic film with an adhesive system. The laminate is heated to between 270–295° F. and molded under pressure of 2 to 8 p.s.i.a and products formed by said process.

3,814,659
NOVEL COMPOSITIONS
Herbert G. Nadeau, New Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed Jan. 3, 1972, Ser. No. 215,162
Continuation-in-part of abandoned application Ser. No. 111,572, Feb. 1, 1971. This application Jan. 3, 1972, Ser. No. 215,162
Int. Cl. B32b *3/26*
U.S. Cl. 161—161 **15 Claims**



Thermal barrier laminates are disclosed having a polyisocyanurate foam core, outer facing sheets and one or more inner layers of heat resistant material extending through the core serving to separate the core into two or more distinct layers. This structure leads to greatly enhanced resistance to heat penetration and total degradation of the thermal barrier upon exposure to fire. Incorporation of the thermal barrier laminate into a build-up roof not only provides thermal insulation but forms a fire retardant barrier adequate to meet existing construction codes for such structures. The thermal barrier laminates can also be employed in a variety of ways in which existing barriers are employed, e.g. building panels, fire doors, pipe insulation and the like.

3,814,660

DRAFTABLE NON-TWISTED STAPLE FIBER BAND AND PROCESS FOR THE MANUFACTURE OF A DRAFTABLE STAPLE FIBER BAND OF HIGH DENSITY AND BREAKING LENGTH

Werner Naegeli, Winterthur, Switzerland, assignor to Pavena A.G., Basel, Switzerland

Continuation of abandoned application Ser. No. 725,239, Sept. 19, 1967, which is a division of application Ser. No. 388,430, Aug. 10, 1964, now Patent No. 3,432,889. This application Oct. 18, 1971, Ser. No. 189,969
Claims priority, application Switzerland, Aug. 16, 1963, 10,231/63; Germany, Mar. 5, 1964, P 33,758
Int. Cl. D02g *3/00*; D04h *11/00*
U.S. Cl. 161—176 8 Claims

A non-twisted consolidated staple fiber sliver possessing high density and small specific volume which is capable of being drafted. A dried fixing agent surrounds individual fibers of the sliver. The fixing agent binds the fibers to one another so strongly that the breaking length of the sliver considerably exceeds that of a twisted roving formed of the same staple fibers as the sliver, yet not bonded, and possessing the same weight per unit length as the bonded staple fiber sliver.

3,814,661

PROCESS FOR BONDING FABRIC AND OTHER CARRIERS TO HIGHLY PLASTICIZED POLYVINYL CHLORIDE USING A FIRE-RETARDING ADHESIVE

Maurice W. Hart, Jr., 714 Anastia Ave., Coral Gables, Fla. 33134

Filed Dec. 23, 1971, Ser. No. 211,717
Int. Cl. B32b *27/30*; C09j *5/00*
U.S. Cl. 161—191 6 Claims

This disclosure is concerned with a novel heat-releasable fire retardant-containing cold curing mastic for securing a fabric or other carrier of a highly plasticized polyvinyl chloride covering and the like to a surface that is to be weatherproofed and flame protected. In a preferred composition, an evaporation curing emulsion of latex and plasticized polyvinyl acetate is employed containing phosphate plasticizer and aluminum hydroxide or hydrate dispersed through the emulsion with from substantially 50 to 64 parts of total solids per 100 parts of liquid in the emulsion.

3,814,662

PULPING SYSTEM WITH IMPREGNATION DIGESTER HAVING LIQUOR RECIRCULATION AND CLEANING LOOP

James R. Starrett, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Continuation of abandoned application Ser. No. 856,039, Sept. 8, 1969. This application Mar. 3, 1972, Ser. No. 231,689
Int. Cl. D21c *3/24, 11/00, 11/10*
U.S. Cl. 162—19 26 Claims

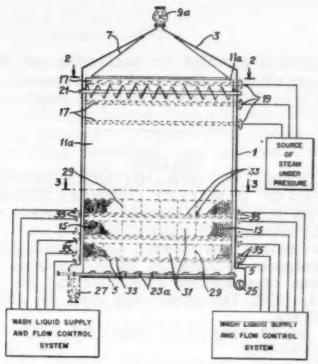
A pulping system and process for successive impregnation, cooking and defiberizing of raw material in a continuing flow thereof under conditions of temperature and pressure which dictate a gentle and effective separation. The system features, in connection with the impregnation vessel employed, a recirculation system for maintaining in the impregnator a bath of conditioning liquid of uniform temperature and concentration. The recirculation system includes a discharge conduit which connects to the impregnation digester below the level of bath therein and carries the liquid to bottom portion of a flash tank. A delivery conduit connected to the bottom of the flash tank carries the liquor through a pump and heat exchanger back to the impregnation digester below the bath level. White liquor can be added to the liquid in the delivery conduit between the flash tank and the pump. A secondary recirculation of the liquor is accomplished by use of a conduit connected to the delivery conduit downstream of the pump which carries some of the liquor through another heat exchanger and into the top portion of the flash tank. Contaminated steam is removed from the top of the flash tank.

3,814,663

METHOD AND APPARATUS FOR THE CONTINUOUS DIGESTION OF CELLULOSIC MATERIALS

Gosta Ingemar Ingemarsson, Karlstad, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Nov. 26, 1971, Ser. No. 202,484
Claims priority, application Sweden, Nov. 27, 1970, 16,095/70, 16,096/70
Int. Cl. D21c *7/00, 9/02*
U.S. Cl. 162—60 17 Claims



Cellulosic materials are continuously digested and subsequently washed with a liquid to produce a pulp in a closed, substantially straight vessel having at least one partition structure within it and extending generally transversely and substantially longitudinally of the vessel to divide it into at least two generally longitudinally extending compartments. Steam is introduced into the upper part of the vessel for digestion of the material, and a washing liquid is introduced separately under controlled conditions into the respective compartments to wash the material. Cellulosic materials which have been pretreated with chemicals that promote digestion are introduced separately into each compartment and are withdrawn separately from each compartment at controlled rates.

3,814,664

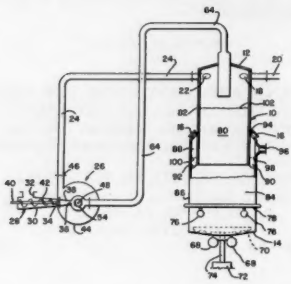
GASEOUS REACTION APPARATUS INCLUDING A PERIPHERAL GAS RECEIVING CHAMBER

Lawrence A. Carlsmith, Amherst, N.H., assignor to Improved Machinery Inc., Nashua, N.H.

Filed Sept. 11, 1972, Ser. No. 288,031
Int. Cl. D21c *7/00, 9/10*
U.S. Cl. 162—236 10 Claims

Gaseous reaction apparatus including a generally vertical vessel, a conduit for supplying gas to the upper end of the vessel, a conduit for causing material to be blown into the upper end of the vessel by gas discharged from the latter, and an outlet for discharging material from the lower end of the vessel. A gas receiving chamber

peripherally of the vessel is open to the vessel intermediate the ends of the latter for receiving a carrier or other gas from a gas-material mixture in the vessel,



and an outlet is provided for discharging gas from the gas receiving chamber. One use for this gaseous reaction apparatus is in the gaseous bleaching of pulp.

3,814,665

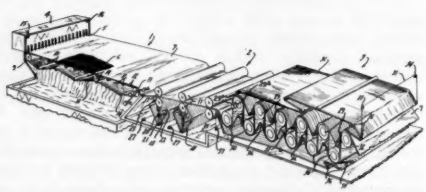
SINGLE ENDLESS STRAND MOUNTED IN A SERIES OF PARALLEL CONVOLUTIONS AS A FIBROUS WEB SUPPORTING SURFACE IN A PAPERMAKING MACHINE

Frank H. Orbison and Howard M. Helland, Appleton, Wis., assignors to Appleton Mills, Appleton, Wis.

Continuation of abandoned application Ser. No. 10,412, Feb. 11, 1970. This application Mar. 29, 1972, Ser. No. 239,329

Int. Cl. B65g *15/12*; D21f *1/10, 7/12*

U.S. Cl. 162—274 **4 Claims**



A dynamic paper web supporting structure for a papermaking machine, in which cross direction elements are eliminated. A single endless strand is mounted to travel in an endless path over a series of rolls, and adjacent machine direction loops or convolutions of the endless strand are in closely spaced parallel relation and form a moving supporting surface for the paper web and advance the web through the machine. During the papermaking process both water and water vapor are extracted, while the paper sheet is being formed, pressed and dried. Alternate convolutions of the single endless strand can be separated from the supporting surface and passed in angular contacting relation with each other for cleaning purposes. A pivotable comb can also be employed in contact with the strand convolutions outside the supporting surface to adjust the spacing therebetween.

3,814,666

STAGGERED CONE DEFLECTORS

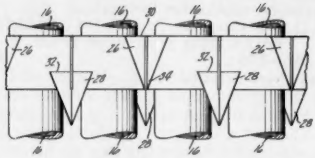
John N. Calvin, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 4, 1971, Ser. No. 103,451

The portion of the term of the patent subsequent to May 16, 1989, has been disclaimed

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 **14 Claims**



A flow deflector for cooling fluid flowing longitudinally in channels between spaced parallel nuclear fuel reactor elements positioned laterally by intersecting grid elements. The deflector comprises a plurality of cones positioned at the intersection of said grid elements with their apexes pointed upstream to deflect the flow laterally toward and across the fuel elements and arranged in spaced staggered relation at different elevations on the grid to reduce flow resistance.

3,814,667

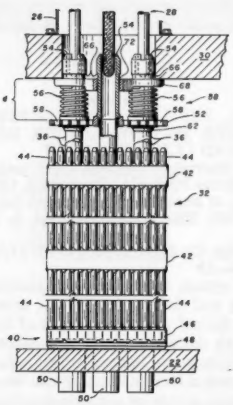
FUEL ASSEMBLY HOLD-DOWN DEVICE

Ralph H. Klumb, Simsbury, and John J. Hutchinson, Windsor, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Original application May 20, 1971, Ser. No. 145,374. Divided and this application Jan. 24, 1973, Ser. No. 326,354

Int. Cl. G21c *19/02*

U.S. Cl. 176—87 **5 Claims**



The invention provides a hold-down device which maintains a net downward force on a fuel assembly in a nuclear reactor under all thermal and hydraulic conditions in the reactor core region. The hold-down device is particularly applicable in reactors having stainless steel support barrels and Zircaloy guide tubes.

The hold-down device of the preferred embodiment of the invention is comprised of coil springs coaxially

disposed about alignment posts which extend upwardly from the top end plate of each fuel assembly. A hold-down plate is slideably mounted on the alignment posts and the coil springs are interposed, in compression, between the hold-down plate and the top end plate. In use, the coil springs bias the hold-down plate upwardly against a core alignment plate to provide a downward force on the fuel assembly. The hold-down plate may also serve as a lifting surface for the fuel assembly during fuel handling.

3,814,668

METHOD AND DEVICE FOR THE SEMI-QUANTITATIVE DETERMINATION OF GLUCOSE IN AQUEOUS FLUIDS

Kenneth Allen Blake, Billy Harper Haden, and William Fred Hendershot, Elkhart, Ind., and La Vell Rolfson Johnson, Salt Lake City, Utah, assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Oct. 15, 1969, Ser. No. 866,730

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 C **16 Claims**

Improved method and device for the semi-quantitative determination of glucose in aqueous fluids such as urine comprising glucose oxidase, a water soluble iodide salt, and a substance having peroxidative activity. The composition is incorporated with a carrier member therefor and/or a semi-permeable membrane such as ethylcellulose. A preferable embodiment of the present invention comprises the inclusion of a background coloring material such as brilliant blue FCF in the test composition.

3,814,669

DETERMINATION OF GLUTAMIC-OXALACETIC TRANSAMINASE

Harry Goldenberg, Los Angeles, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation of abandoned application Ser. No. 39,501, May 21, 1970. This application Oct. 5, 1972, Ser. No. 295,348

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 R **1 Claim**

An improved method of determining amounts of the enzyme glutamic-oxalacetic transaminase in body fluids is decribed. The method is based on the reaction between a diazonium salt color developer and oxalacetic acid produced during incubation of the body fluid with a suitable substrate and the comparison of the reciprocal of the depth of color obtained thereby to the reciprocal of the depth of color obtained with a known amount of said enzyme.

3,814,670

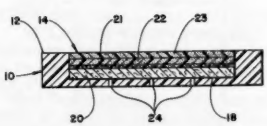
TEST ARTICLE FOR USE IN MICROBIOLOGY

Ronald Freake and Billy Harper Haden, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 26, 1972, Ser. No. 247,868

Int. Cl. C12b *1/00*

U.S. Cl. 195—127 **29 Claims**



Test article for use in culturing, detecting and analyzing microorganisms comprising an absorbent web and a substantially dry, stable, continuous layer of a gel such as agar or gelatin, joined in laminar relationship therewith by a continuous interface integral with said web and gel layer and comprising a composite of the web and gel layer. Said device may be additionally comprised of one or more substantially dry, stable, continuous overlayers of a gel positioned in laminar relationship with the initial gel layer. Such gel overlayer is preferably incorporated with a reagent which includes microbiological nutrient media, background dyes and color indicators.

3,814,671

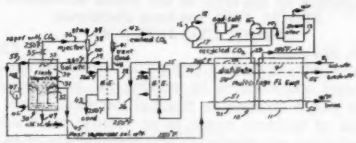
METHOD AND APPARATUS FOR SALINE WATER CONVERSION

Paul S. Roller, 825 Colorado Bldg., 1341 G St. NW., Washington, D.C. 20005

Filed Apr. 20, 1972, Ser. No. 245,732

Int. Cl. B01d *3/06*

U.S. Cl. 203—7 **14 Claims**



Saline water containing scale-forming alkaline bicarbonate is indirectly heated while avoiding alkaline scale, due to the presence of recycled CO_2. The heated saline water is flash vaporized and alkaline bicarbonate thermally decomposed, forming CO_2, a precipitate of alkaline scale compound and flashed saline water. The flashed vapor with included CO_2 is condensed and CO_2 released from hot condensate as evolved CO_2; the latter is recycled to the saline water, while discharging excess evolved CO_2. Precipitate of alkaline scale compound is separated from flashed saline water and employed as nucleant for precipitate formed in flash vaporization, whereby the thermal decomposition is accelerated. The flash vaporization may be conducted in stages, a slight residual of alkaline bicarbonate in the flashed saline water being thereby reduced to an indefinitely small value. The flashed saline water is evaporated in a multi-stage flash evaporator; or this combined with a surface heat evaporator forming concentrated brine and fresh water at high yield.

3,814,672

PROCESS FOR REPRODUCING MAGNETIZATION PATTERN BY PLATING

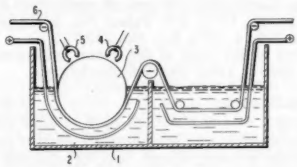
Tatsuji Kitamoto and Masashi Aonuma, Kanagawa, and Kazuhiro Kawaziri, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 7, 1971, Ser. No. 187,251

Claims priority, application Japan, Oct. 7, 1970, 45/88,139

Int. Cl. C23b *5/50, 5/54*; C23c *3/02*

U.S. Cl. 204—12 **28 Claims**



A magnetization pattern on a magnetic recording medium is reproduced by plating a ferromagnetic metal or alloy on a thin layered support such as polyethylene terephthalate film while bringing the support into intimate

contact with the magnetic recording surface until the average thickness of the resulting plated layer reaches at least 50 A., separating the magnetic recording surface, and continuously plating the support in the substantial absence of an exterior magnetic field whereby the corresponding magnetization pattern is reproduced on the thin support.

3,814,673

PROCESS FOR TANTALLIDING AND NIOBIDING BASE METAL COMPOSITIONS

Newell C. Cook, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Continuation of abandoned application Ser. No. 838,636, July 2, 1969. This application Oct. 15, 1971, Ser. No. 189,763

The portion of the term of the patent subsequent to May 26, 1987, has been disclaimed

Int. Cl. C23b *5/30, 5/48*

U.S. Cl. 204—39 11 Claims

A tantallide or niobide coating is formed on specified base metal compositions by making the base metal the cathode joined through an external electrical circuit to a tantalum or niobium anode in an electric cell having a specified fused salt electrolyte at a temperature of at least 900° C., but below the melting point of the metal composition. Such a combination is a self-generating cell producing electricity, but an external E.M.F. may be impressed providing the current density does not exceed 10 amperes/cm.^{2}. The process is useful in making tight adherent coatings composed of tantalum or niobium and the base metal on the surface of the substrate.

3,814,674

ELECTRODEPOSITION OF COBALT

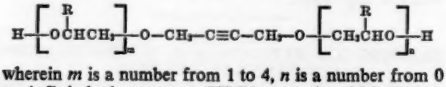
Norman C. Adamowicz, Inkster, Roy W. Klein, St. Clair Shores, Robert A. Tremmel, Wyandotte, and Richard J. Clauss, Allen Park, Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Filed Nov. 5, 1970, Ser. No. 87,322

Int. Cl. C23b *5/08, 5/32*

U.S. Cl. 204—43 T 10 Claims

A process for the electrodeposition of bright cobalt or cobalt-nickel alloy electroplates containing at least 50% cobalt in which the aqueous cobalt plating baths from which the electroplates are deposited contain at least 0.05 millimoles per liter of a brightener having the formula:



wherein m is a number from 1 to 4, n is a number from 0 to 4, R is hydrogen or a CH_2R' group in which R' is a chloro, hydroxy or sulfonic group.

3,814,675

METHOD FOR THE PRODUCTION OF EXTRA-HIGH STRENGTH GALVANIZED WIRE

Richard L. Sallo, Unity Township, Westmoreland County, and Charles D. Stricker, Monroeville Borough, Pa., assignors to United States Steel Corporation

No Drawing. Continuation-in-part of application Ser. No. 30,358, Apr. 20, 1970, now Patent No. 3,668,090. This application Feb. 4, 1972, Ser. No. 223,732

The portion of the term of the patent subsequent to June 6, 1989, has been disclaimed

Int. Cl. C23b *1/04*

U.S. Cl. 204—145 R 4 Claims

High strength wire is produced by a suitable combination of alloying additions with drawing and/or patenting operations. To prevent serious loss of strength in the lubricant removal stage, an electrolytic cleaning treatment at a current density of 30–60 amps/in.^{2} is substituted for conventional lead charring. Further losses in strength are then prevented through the use of shorter than normal immersion times in zinc spelter maintained at a temperature of 820° to 850° F. The latter treatment serves a dual function in that it also supplies any stress relieving which may be required.

3,814,676

RADIATION PROCESS OF PREPARING GRAFTED ELASTOMERIC FIBERS WHEREIN POST-DECRYSTALLIZATION IS EMPLOYED

Joel L. Williams, Cary, and Vivian T. Stannett, Raleigh, N.C., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Filed Oct. 7, 1971, Ser. No. 187,505

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—159.12 6 Claims

Cellulose-containing fibrous materials such as rayon yarn are converted into elastic materials by a process in which the fibrous materials are irradiated, an acrylate monomer is graft copolymerized onto the irradiated material and the product of the grafting process is treated with a decrystallizing agent. The elastic product obtained possesses good extensibility and elastic recovery and can be used in place of fibrous rubber in the preparation of elastic products.

3,814,677

PROCESS OF POLYMERIZATION

Hendrik Adrian Jacobus Battaerd, 3 Longbourne Ave., North Clayton, Victoria 3168, Australia; John Gannon Clouston, 24 Bungala St., Carff Park, New South Wales, Australia; and Philip William Moore, 10A Bruce Road, Mensi, New South Wales, Australia

No Drawing. Filed Sept. 26, 1972, Ser. No. 292,274

Claims priority, application Australia, Sept. 28, 1971, 6,455/71

Int. Cl. C08f *1/16*

U.S. Cl. 204—159.22 6 Claims

A method of polymerizing a mixture containing from 3 to 100% of compounds containing two or more allyl groups which method comprises exposing said mixture to high energy irradiation at a temperature in the range from −80 to +120° C., preferably from 10° to 90° C. and at a pressure in the range from 1,000 p.s.i. to 100,000 p.s.i. and isolating the polymer salt so formed. The polymer product has improved ion exchange properties.

3,814,678

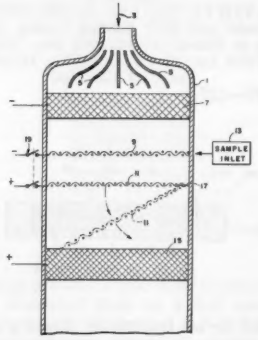
ELECTROPHORETIC SAMPLE INSERTION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Louis R. McCreight, Wayne, Pa.

Filed June 6, 1972, Ser. No. 260,093

Int. Cl. B01k *5/00*

U.S. Cl. 204—180 R 6 Claims



Two conductive screens located in the flow path of an electrophoresis sample separation apparatus are charged

electrically. The sample is introduced between the screens, and the charge is sufficient to disperse and hold the samples across the screens. When the charge is terminated, the samples are uniformly distributed in the flow path. Additionally, a first separation by charged properties has been accomplished.

3,814,679
PREPARATION OF FUELS FOR SUPERSONIC AIRCRAFT

Robert Erlmeier, Munich, Friedrich Hilberath, Walberberg, Ewald Meisenburg, Wesseling, and Gunter Spengler, Munich, Germany, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling, near Cologne, Germany

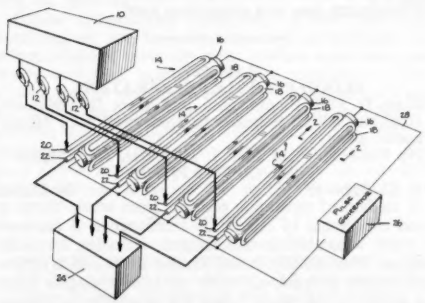
No Drawing. Continuation-in-part of abandoned application Ser. No. 88,204, Nov. 9, 1970. This application Mar. 13, 1972, Ser. No. 234,313
Int. Cl. C10l *1/04*; C07c *5/04*
U.S. Cl. 208—15 **5 Claims**

Fuels for supersonic aircraft prepared by oligomerizing C_3 and C_4 hydrocarbons which are first made free of isobutylene and hydrogenating the oligomerizates.

3,814,680
PROCESS AND APPARATUS FOR PURIFICATION OF MATERIALS

M. Dale Wood, Hasbrouck Heights, N.J., assignor of a fractional part interest to Harold Meltzer, Jersey City, N.J.

Filed May 6, 1971, Ser. No. 140,919
Int. Cl. C02b *3/10*
U.S. Cl. 210—64 **7 Claims**



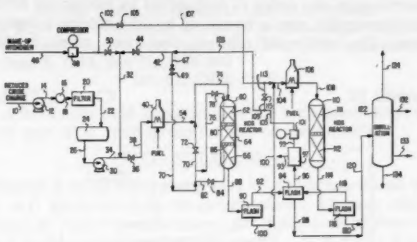
Purification of materials such as liquids is accomplished by subjecting the material to ultraviolet radiation. The ultraviolet light source is operated at high frequency while maintaining the germicidal wavelength thereof.

3,814,681
CONTROL OF ASPHALTIC OIL HYDRODESULFURIZATION PROCESS

Joel D. McKinney and John A. Paraskos, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 8, 1971, Ser. No. 206,078
The portion of the term of the patent subsequent to Nov. 27, 1990, has been disclaimed
Int. Cl. C10g *23/02*
U.S. Cl. 208—210 **9 Claims**

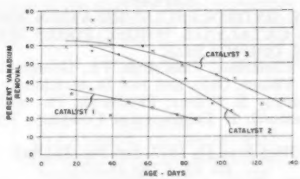
Asphalt-containing oils are hydrodesulfurized without excessively converting the asphaltenes and resins present by controlling the extent of desulfurization of the asphaltic portion of the oil in response to the quantity of aromatics present. As the asphaltic oil passes through a hydrodesulfurization zone, the aromatic content of the oil increases due to *in situ* production of aromatics. The oil is withdrawn from the hydrodesulfurization zone when the aromatic content no longer increases.



3,814,682
RESIDUE HYDRODESULFURIZATION PROCESS WITH CATALYSTS WHOSE PORES HAVE A LARGE ORIFICE SIZE

Robert D. Christman, Pittsburgh, Pa., George E. Elliott, Jr., Bay Village, Ohio, and Joel D. McKinney, Indiana, and Geoffrey R. Wilson, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,634
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 **7 Claims**



A process for the hydrodesulfurization of a crude oil or a reduced crude oil containing the asphaltene fraction of the oil comprising passing said oil and hydrogen over a catalyst comprising supported Group VI and Group VIII metals for a total throughput of at least 34 barrels of oil per pound of catalyst. The pore radius of the catalyst at which one-half of the total pore volume is filled with liquid nitrogen in a liquid nitrogen desorption isotherm measurement is between 58 and 80 A. The pore radius of the catalyst at which one-half of the total pore volume is filled with liquid nitrogen in the preceding adsorption portion of the same isotherm measurement is at least 15 A. higher than said desorption measurement but not higher than 114.6 A.

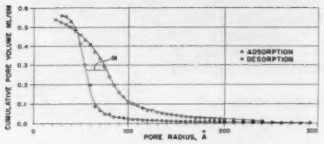
3,814,683
HYDRODESULFURIZATION PROCESS WITH CATALYSTS WHOSE PORE SIZES ARE CONCENTRATED IN A NARROW RANGE

Robert D. Christman, Pittsburgh, Joel D. McKinney, Indiana, and Geoffrey R. Wilson, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,842
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 **20 Claims**

A process for the hydrodesulfurization of a crude oil, a reduced crude oil or a heavy gas oil comprising passing

said oil and hydrogen over a catalyst comprising supported Group VI and Group VIII metals. The catalyst has a pore volume of at least 0.40 cc./gram with at least 65 percent of the pore volume included within a relatively narrow pore size range as determined by isothermal nitrogen desorption measurement at liquid nitrogen temperatures. The isothermal nitrogen desorption graph for the



catalyst shows that the change of volume of nitrogen in the catalyst per unit change in pore radius versus increasing pore radii within said narrow pore size range exhibits at least one peak from which the curve descends and during its descent it reverses direction and reascends, with a descent and reascent magnitude of at least 0.001 milliliters per gram per angstrom unit, to form at least one other peak within said narrow pore size range.

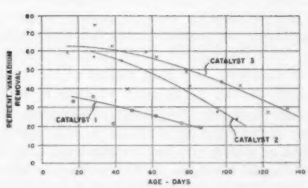
ERRATUM

For Class 210—64 see:
Patent No. 3,814,680

3,814,684
RESIDUE HYDRODESULFURIZATION PROCESS WITH CATALYSTS WHOSE PORES HAVE A SMALL ORIFICE SIZE

Robert D. Christman, Pittsburgh, Pa., George E. Elliott, Jr., Bay Village, Ohio, and Joel D. McKinney, Indiana, and Geoffrey R. Wilson, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,844
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 **8 Claims**



A process for the hydrodesulfurization of a crude oil or a reduced crude oil containing the asphaltene fraction of the oil comprising passing the oil and hydrogen over a catalyst comprising supported Group VI and Group VIII metals for a total throughput of less than 34 barrels of oil per pound of catalyst. The pore radius of the catalyst at which one-half of the total pore volume is filled with liquid nitrogen in a liquid nitrogen desorption isotherm measurement is above 40 but less than 58 A. The pore radius at which one-half of the total pore volume is filled with liquid nitrogen in the preceding adsorption portion of the same isotherm measurement is between 15–30 A. higher than said desorption measurement.

3,814,685
REMOVAL OF MERCURY FROM MERCURY CATHODE SLUDGE

Donald G. Rachor and Richard A. Perry, Bellingham, Wash., assignors to the United States of America as represented by the Administrator of the United States Environmental Protection Agency

No Drawing. Filed Apr. 27, 1973, Ser. No. 354,983
Int. Cl. C02b *1/18*; C01d *1/16*
U.S. Cl. 210—59 **10 Claims**

Mercury is recovered from mercury cathode sludge by treating the sludge with acid and then roasting. The mercury content of the residue is reduced significantly lower than when the acid treatment step is omitted.

3,814,686
TREATMENT OF SEWAGE OR CONTAMINATED WATER

Danvers Allin Swales, Harrogate, England, assignor to Albright & Wilson Limited, Oldbury, near Birmingham, Warwickshire, England

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,742
Claims priority, application Great Britain, Nov. 20, 1970, 55,407/70
Int. Cl. B01d *21/00*
U.S. Cl. 210—47 **10 Claims**

A method for removing suspended solids from contaminated water by adding a coagulant composition. The coagulant composition is prepared by digesting chrome residue containing 35–40% by weight of Fe_2O_3, 27–32% Al_2O_3, 13–18% MgO, and 12–17% Cr_2O_3 with a strong mineral acid selected from the group consisting of 20–36% by weight hydrochloric acid and 20–100% by weight sulphuric acid to form a solution of metal salts, said solution containing trivalent iron, aluminum, and chromium ions, and magnesium ions.

3,814,687
BLOOD PLATELET SEPARATION

William D. Ellis, Bloomington, and Bruce D. Mulvaney, Hopkins, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

No Drawing. Filed June 1, 1973, Ser. No. 365,884
Int. Cl. B01d *21/00*
U.S. Cl. 210—49 **20 Claims**

A method of separating platelets from whole blood or blood constituent by separation fractionation is disclosed in which a combination of reagents including formaldehyde or other suitable blood fixative agent and a separation dextran polymer or other suitable separation agent are added to the whole blood for separating a platelet-containing fraction thereof and the resulting mixture allowed to separate leaving a layered structure from which the desired fraction may be easily recovered.

3,814,688
LIQUID FILTER APPARATUS

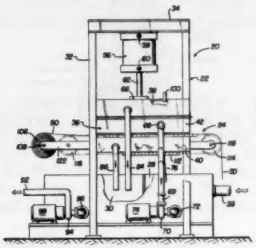
Gene Hirs, Birmingham, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Aug. 30, 1972, Ser. No. 284,818
Int. Cl. B01d *29/02*
U.S. Cl. 210—297 **3 Claims**

A liquid filtering apparatus, wherein the contaminant liquid is introduced between opposed, planar, horizontal filter media and flows simultaneously through the opposed media to accrete the contaminants on the confronting faces of the media. The filter media are cleaned by interrupting the flow of contaminant liquid and backwashing the upper filter to collect the contaminants on the lower filter media only. The lower filter is then removed and discarded with all of the contaminants thereon.

The apparatus includes three chambers. A fixed planar filter media is secured between the upper and medial

chambers and a removable, disposable filter media is disposed between the medial and lower chambers. The removable filter medium is supported on a continuous conveyor and the medial and lower chambers are separable to remove the disposable filter medium and the contaminants previously collected on both filter media.



3,814,689
POLYFLUOROALKYL-DIMETHYL POLYSILOXANE/POLYOL ALIPHATIC ESTER GREASES
John B. Christian, Yellow Springs, Ohio, assignor to Aerospace Lubricants, Inc., Columbus, Ohio
No Drawing. Filed Mar. 13, 1973, Ser. No. 340,657
Int. Cl. C10m *7/50*
U.S. Cl. 252—21 **9 Claims**

Grease compositions comprising: a base fluid blend consisting of polyfluoroalkyl-dimethyl polysiloxane and polyol aliphatic ester oils with selected viscosities, pour points, and flash points; thickeners consisting of finely divided sodium montmorillonite clay in combination with a finely divided fluorinated ethylene and propylene copolymer or a tetrafluoroethylene polymer; and antimony dialkyldithiocarbamate. The grease compositions have good anti-wear and good extreme pressure characteristics at temperatures in the —65° F. to 350° F. range.

3,814,690
POLYMERIC POUR POINT DEPRESSANTS OF VINYL AROMATIC AND ALKYL FUMARATE
Won R. Song, Maplewood, N.J., assignor to Esso Research and Engineering Company
No Drawing. Filed Oct. 10, 1972, Ser. No. 296,121
Int. Cl. C10m *1/28*
U.S. Cl. 252—56 D **5 Claims**

Pour point depressants for petroleum distillates and lubricating oils comprise interpolymers, synthesized with the aid of free-radical initiators, from monomers comprising a C_8 to C_{14} vinyl aromatic hydrocarbon with a mixture of straight chain alkyl fumarates wherein 20 to 80 mole percent of the alkyl groups are in the C_{16-20} range, and 80 to 20 mole percent are in the C_{10} to C_{14} range. These mixed alkyl groups can be obtained from: (A) an unsymmetrical C_{10} to C_{20} dialkyl fumarate in which the chain length of the alkyl radicals in the fumarate ester differs preferably by at least four carbon atoms; (B) at least two C_{10} to C_{20} symmetrical dialkyl fumarates which differ preferably in the length of the alkyl radicals in each ester by at least four carbon atoms; (C) mixtures of an unsymmetrical C_{10} to C_{20} dialkyl fumarate as in (A) with at least one symmetrical C_{10} to C_{20} dialkyl fumarate as in (B); and (D) mixtures of unsymmetrical dialkyl fumarates as in (A), or at least two symmetrical fumarate esters as in (B), or mixtures of symmetrical and unsymmetrical esters as in (C), with at least one vinyl alcohol ester of a C_2 to C_{18} alkanoic acid.

3,814,691
ALKYL (POLYALKOXY) SILANES AS COMPONENTS IN HYDRAULIC FLUIDS
David A. Csejka, Orange, and Henry F. Lederle, North Haven, Conn., assignors to Olin Corporation
No Drawing. Continuation-in-part of abandoned application Ser. No. 75,719, Sept. 25, 1970. This application June 5, 1972, Ser. No. 259,894
Int. Cl. C09k *3/00*
U.S. Cl. 252—78 **21 Claims**

A hydraulic fluid containing as the base component at least one alkyl (polyalkoxy) silane of the formula:

$$(R[O—R'']_yO)_zSiR'_{4-z}$$

wherein R is an alkyl group of 1 to 10 carbon atoms or an aryl group of 6 to 10 carbon atoms, R′ is an alkyl group of 1 to 4 carbon atoms, R″ is alkylene of from 2 to 4 carbon atoms, y is an integer of 1 to 5 and z is an integer of 1 to 3. Additionally, the hydraulic fluid of this invention may contain a base component made up of a mixture of selected alkyl (polyalkoxy) silanes, as defined above, and selected borate esters.

3,814,692
FREE FLOWING SOAP-NONIONIC DETERGENT
John H. Mostow, Metuchen, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Continuation of abandoned application Ser. No. 167,452, July 29, 1971. This application July 9, 1973, Ser. No. 377,678
Int. Cl. C11d *9/26*
U.S. Cl. 252—108 **7 Claims**

Novel particulate blends of soap and liquid nonionic surfactants and a method for preparing same, is disclosed. The new method includes the combination of an appropriate fatty acid with the liquid nonionic surfactant before saponification of the acid. The novel particulate blends are dry, non-tacky and free flowing and are suitable for post addition to spray dried detergent powders or for use by themselves or with builders as final detergent formulations.

3,814,693
CLEANSING COMPOSITION
Harvey Kudler, 2356 Garfield St., North Bellmore, N.Y. 11710
No Drawing. Filed Nov. 10, 1972, Ser. No. 305,262
Int. Cl. C11d *9/12, 9/14, 17/08*
U.S. Cl. 252—111 **7 Claims**

An aqueous based cleansing composition containing amonium hydroxide; an inorganic water soluble builder salt; an admixture of potassium chloride and potassium carbonate; an aqueous saturated soap solution of alkali metal salts of saturated fatty acids containing from 8 to 18 carbon atoms; and an organic solubilizing agent. The compositions are especially useful for cleaning glass surfaces.

3,814,694
NON-TOXIC GAS GENERATION
Karl Klager, Sacramento, and Albert O. Dekker, Carmichael, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
No Drawing. Filed Aug. 9, 1971, Ser. No. 170,325
Int. Cl. B60r *21/08;* **C06d** *5/06;* **C09k** *3/00*
U.S. Cl. 252—186 **28 Claims**

There are disclosed compositions of solid materials capable of producing non-toxic gases by a rapid chemical reaction upon initiation of the reaction. The solid materials comprise a solid inorganic reducing agent and a solid inorganic oxidizing agent mixed together in finely divided or granular form and compacted without the presence of either a binder or solvent. Typical solid inorganic reducing agents are the salts of hydrazine, hydroxylamine and hydrazoic acid. Typical solid oxidizing compounds are the salts of nitric acid, nitrous acid,

chloric acid and perchloric acid. The gases typically produced are some or all of nitrogen, water and oxygen, and without the presence of toxic gases such as those containing carbon. The gases are developed spontaneously within milliseconds but without explosive force.

3,814,695

WATER WASHABLE PENETRANT

Orlando Gomez Molina, Westminster, Calif., assignor to Air Products and Chemicals, Inc.

Continuation-in-part of abandoned application Ser. No. 833,208, Jan. 16, 1969. This application Dec. 23, 1971, Ser. No. 211,631

Int. Cl. C09k *1/02, 3/00;* **G01n** *29/04*
U.S. Cl. 252—301.2 P **8 Claims**

This disclosure is of a dye penetrant composition in liquid form adapted to enter minute surface defects when coated uniformly over a workpiece surface and to dry rapidly thereafter. The composition includes a wetting agent whereby the coated surface may be washed clean by application of water to remove excess penetrant, leaving only residual dye in the minute defects. Where the composition contains fluorescent dye, inspection is accomplished by viewing the workpiece under black light to detect residual traces of dye on the bare surface. Where daylight visible dye is used in the penetrant composition, a developer including a wetting agent similar to that in the penetrant may be applied after the mentioned washing step to render the dye visible in the developer coating, which is thereafter removed by water washing when the inspection is completed.

3,814,696

COLLOIDAL METAL IN NON-AQUEOUS MEDIA

Joseph A. Verdone, Greece, and Michael K. Kebles, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 19, 1972, Ser. No. 264,084

Int. Cl. B01g *1/00;* **B01j** *13/00*
U.S. Cl. 252—317 **4 Claims**

Colloidal metal having an average diameter range from about 45 A. to about 300 A. in a non-aqueous medium is prepared by reduction of a water soluble metal salt by a reducing agent, such as, a borohydride, in the presence of a fatty acid or fatty acid salt, such as, myristic acid or myristate, in an aqueous solution. Noble metals are preferred, particularly silver and palladium. An organic water immiscible solvent, such as, toluene, is added to the solution and acidified. The organic solvent phase is separated with the colloidal metal suspended therein.

3,814,697

LATHERER FOR SOAP LIQUID

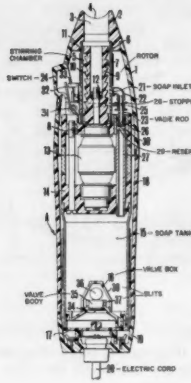
Jusuke Hashimoto, 26, 2-chome, Nagahoribashi-Suji, Osaka-fu, Minami-ku, Osaka, Japan

Filed June 9, 1972, Ser. No. 261,329

Claims priority, application Japan, Dec. 16, 1971, 46/120,094; Feb. 12, 1972, 47/15,085

Int. Cl. B01d; B01f
U.S. Cl. 252—359 E **2 Claims**

A latherer for a liquid soap is disclosed. The latherer includes a casing for accommodating the mechanism of the latherer therewithin. A nozzle is mounted on the casing at the upper opening thereof. In the casing a stirring chamber is located and the stirring chamber accommodates a rotor having a blade for stirring a liquid soap. A motor for driving the rotor and a tank for supplying a soap liquid are mounted on the casing. The tank communicates with the stirring chamber through a passage. A valve is provided within the passage and a switch is provided on



the casing the switch being adapted to open and close the valve.

3,814,698

SOAP COMPOSITION AND PROCESS OF PRODUCING SUCH

Peter J. Ferrara, Ridge Road, Cornwall, N.Y. 12518; Gaston Dalby, Saint Germain du Salembre, Neuvic-sur-l'Isle, France; and Clarence A. Barnes, Jr., 829 Park Ave. 10021; and Roy Gordon, 110 East End Ave. 10028, both of New York, N.Y.

No Drawing. Filed Jan. 10, 1972, Ser. No. 216,828

Int. Cl. C11d *9/48, 13/00, 13/10*
U.S. Cl. 252—370 **6 Claims**

Solid soap such as framed or milled toilet soap, which is conventional in all aspects except that it contains as part of its composition 5 to 100%, based upon the weight of free fatty acid components, of at least one "bath oil." The solid soap composition is produced by first saponifying an appropriate fatty acid or mixture thereof in the usual way, solidifying the saponified material by cooling, extruding ribbons of solidified material, drying the extrudate, and then framing the dried extrudate into soap bars. The process hereof differs from this "usual" process in that bath oil, in whatever quantity is desired, is added to the liquid saponification mixture, rather than just prior to the framing step as in the prior art.

3,814,699

SOLUTIONS FOR THE TREATMENT OF AMORPHOUS CARBON OR GRAPHITE MANUFACTURED ARTICLES FOR IMPROVING THEIR RESISTANCE TO OXIDATION

Francesco Baldieri and Carlo Borgianni, Rome, Italy, assignors to Snam Progetti S.p.A., Milanese, Italy

Filed Jan. 22, 1971, Ser. No. 108,739

Claims priority, application Italy, Jan. 22, 1970, 19,661/70

Int. Cl. C09k *3/00;* **B01j** *1/16;* **B44d** *1/20*
U.S. Cl. 252—397 **7 Claims**

This invention provides a solution and novel procedure for imparting oxidation resistance to amorphous carbon or graphite manufactured articles by means of the coat-

ing solution which consists of water, phosphoric acid, one or more compounds selected from the groups of salts, oxides and hydroxides of a metal of the 2nd group of the periodic system; one or both components of the group formed by boric and sodium tetraborate decahydrate and one or more compounds selected from the group consisting of nitric acid, sodium nitrite and sodium carbonate.

3,814,700

METHOD FOR CONTROLLABLY VARYING THE ELECTRICAL PROPERTIES OF NEMATIC LIQUIDS AND DOPANTS THEREFOR

Arieh Aviram, Yorktown Heights, and Ivan Haller, Chappaqua, N.Y., Robert D. Miller, San Jose, Calif., and William R. Young, Mount Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Aug. 3, 1972, Ser. No. 277,535
Int. Cl. G02f *1/16*
U.S. Cl. 252—408 **6 Claims**

There is disclosed herein a method for controllably varying the electrical properties of nematic liquids over a relatively large range by using as dopants for the nematic liquids organic materials that provide ions in which the charge is distributed over several atoms and is shielded from the charge of the counterions by a nonpolar shell. In addition, there are disclosed novel materials which can be advantageously employed as dopants in the method. The dopant materials can be conveniently divided into two classes: (1) compounds consisting of large organic ions or precursors for large organic ions; and (2) complex ions of an alkali metal and a chelating agent. The dopant materials result in ions in which the charge is distributed over several atoms and have sufficient nonpolar groups to insure their solubility in a low-dielectric constant liquid (the nematic liquids), i.e., a dielectric constant of 1–20.

3,814,701

REGENERATION OF SPENT ALUMINA

Jhonce Nelson Browning, South Charleston, W. Va., assignor to FMC Corporation, New York, N.Y.

No Drawing. Filed Aug. 9, 1972, Ser. No. 279,117
Int. Cl. B01j *11/70, 11/72*
U.S. Cl. 252—412 **3 Claims**

A spent alumina that has been in contact with an anthraquinone working solution (made up of an anthraquinone working compound dissolved in one or more solvents) and which has been used to maintain the hydrogen peroxide productivity of the solution is regenerated by roasting the alumina at a temperature of about 300–400° C. until adsorbed organic matter has been removed, contacting the roasted alumina with an aqueous sodium hydroxide solution and roasting the caustic-treated alumina at about 300–400° C. until the alumina has been regenerated.

3,814,702

COMPOSITION FOR PROMOTING THE POLYMERIZATION OF PHOTOPOLYMERIZABLE MASSES

Louis Bourdon, Sainte-Foy-les-Lyon, Etienne Simon, Lyon, Philippe Borrel, St.-Martin-le-Vinoux, and Jean Lehureau, Lyon, France, assignors to Progil, Paris, France

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,228
Claims priority, application France, Dec. 28, 1970, 7046873
Int. Cl. C08f *1/20*
U.S. Cl. 252—426 **3 Claims**

A composition comprising from 10 to 95 wt. percent benzoin, from 20 to 0.5 wt. percent organic acid and from 70 to 1 wt. percent solvent is a photosensitizer for the polymerization of monomers.

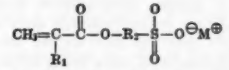
3,814,703

COMPOSITION FOR FORMING AN ELECTRICALLY CONDUCTIVE RESIN FILM

Hiroyuki Nakayama and Kiyohiko Asada, Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Hyogo-ken, Japan

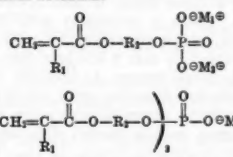
No Drawing. Filed May 8, 1972, Ser. No. 252,514
Claims priority, application Japan, May 31, 1971, 46/37,036
Int. Cl. H01b *1/00*; H01c
U.S. Cl. 257—500 **12 Claims**

This invention relates to a composition for forming an electrically conductive resin film, which comprises (A) resinous compound obtained by introducing ethylenically carbon-carbon unsaturations in a range of 0.3×10^{-3} to 3×10^{-3} mol per one gram of the resinous compound and phosphoric acid groups of not more than 2×10^{-3} mol per one gram of the resinous compounds as pendant groups into a molecular chain of acrylic copolymer having from about 3000 to about 50,000 of a number average molecular weight and having functional groups in the range of 1×10^{-3} to 5×10^{-3} mol per one gram of the acrylic copolymer or into a molecular chain of polyvinyl alcohol having from about 100 to about 5000 of polymerization degree and having more than about 50% of the degree of hydrolysis, and (B) a polymerizable ethylenically unsaturated compound having an ionic free group or admixture thereof selected from the group consisting of sulfoalkyl acrylates or methacrylates or salts thereof represented by the following general formula:



wherein R_1 is hydrogen atom or a methyl group, R_2 is an alkylene group having 1 to 5 carbon atoms, and M is hydrogen atom, sodium, lithium, potassium, copper, magnesium, aluminium, ammonium group, methyl amine group or ethyl amine group,

and phosphoric acid esters or phosphate esters of 2-hydoxyalkyl acrylates or methacrylates represented by the following general formula:



wherein R_1 is hydrogen atom or methyl group, R_2 is an alkylene group having 2 to 4 carbon atoms, M_1 and M_2, which may be the same or different, hydrogen atom, sodium, lithium, potassium, copper, magnesium, aluminium, ammonium group, methyl amine group or ethyl amine group, and M is the same as mentioned above,

and may further comprise (C) other polymerizable ethylenically unsaturated compound and/or (D) polymerization initiator and/or an additive.

3,814,704

PERFUME COMPOSITIONS CONTAINING HEXAHYDRO - 1,4,9,9-TETRAMETHYL-4,7-METHANOAZULENONES

Braja D. Mookherjee, Matawan, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Original application June 10, 1968, Ser. No. 735,545, now Patent No. 3,679,750. Divided and this application Jan. 24, 1972, Ser. No. 220,483
Int. Cl. A61k *7/00*; C11b *9/00*
U.S. Cl. 252—522 **2 Claims**

Novel hexahydro - 1,4,9,9 - tetramethyl-4,7-methanoazulenones useful as olfactory agents; perfume composi-

tions containing such azulenones; and methods for preparing such azulenones and such compositions.

3,814,705
LOW-FOAMING DETERGENT COMPOSITIONS

Jack T. Inamorato, Westfield, N.J., Robert T. Hunter, Grand Rapids, Mich., and Robert E. Dickson, Belle Mead, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed June 6, 1972, Ser. No. 260,320
Int. Cl. B01d *17/00*
U.S. Cl. 252—525 **18 Claims**

Low-foaming detergent composition comprising a synthetic organic detergent, alkaline builder salts, and a 1,1 dialkyl urea as a foam suppressing agent.

3,814,706
SILICONE RESINS USED AS SURFACTANTS IN VINYL CHLORIDE FOAM

Edward T. Simoneau, Burnt Hills, Richard E. Moeller, Troy, and Norman G. Holdstock, Scotia, N.Y., assignors to General Electric Company, Waterford N.Y.

No Drawing. Application Nov. 10, 1970, Ser. No. 88,472, now Patent No. 3,730,931, which is a continuation-in-part of abandoned application Ser. No. 53,973, July 10, 1970. Divided and this application Mar. 1, 1973, Ser. No. 337,070
Int. Cl. C08f *29/34, 47/08*
U.S. Cl. 260—2.5 P **17 Claims**

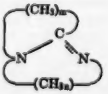
A composition comprising a vinyl chloride polymer, a plasticizer and a silicone resin selected from a silicone resin having $R_3SiO_{1/2}$ monofunctional units and SiO_2 tetrafunctional units with the ratio of the monofunctional units to the tetrafunctional units being from 0.25 to 0.75 with 3.0 to 5.0% by weight of hydroxyl groups and a silicone resin having $R'_3SiO_{1/2}$ monofunctional units and SiO_2 tetrafunctional units and R^2_2SiO difunctional units with the ratio of monofunctional units to tetrafunctional units to difunctional units being from 0.25–0.75 to 1 to 0.05–0.1 with 3.0 to 5.0% by weight of hydroxyl groups and wherein R, R', R^2 are monofunctional hydrocarbon radicals. The composition is mechanically frothed with air to produce a foam which is then heated to gel and fuse the foam. There is preferably used in the above composition one of the above silicone resins which has been further treated so that it has less than about 0.5% by weight of hydroxyl groups. In addition, there is provided a very efficient foaming agent which is produced by adding one of the above silicone resins with a select class of plasticizers, such as dioctyl phthalate.

3,814,707
BICYCLIC AMIDINE CATALYSTS IN POLYURETHANE FOAM PROCESS

Friedrich Möller, Cornelius Muhlhausen, and Günter Hauptmann, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 13, 1968, Ser. No. 712,628
Claims priority, application West Germany, Mar. 15, 1967, F 51,818
Int. Cl. C08g *22/38, 22/46*
U.S. Cl. 260—2.5 AC **7 Claims**

Bicyclic amidines are used as catalysts to promote the reaction between hydroxyl compounds and organic isocyanates. The bicyclic amidines have the general formula



wherein *m* is a whole number from 3 to 7 and *n* is a whole number from 2 to 4.

3,814,708
VINYLIDENE CHLORIDE SERIES RESIN COMPOSITIONS

Fumiya Nagoshi and Hideyuki Arakawa, Kobe, and Kazuo Saito, Nishinomiya, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Dec. 7, 1972, Ser. No. 312,978
Int. Cl. C08f *19/14, 21/04*
U.S. Cl. 260—23 XA **7 Claims**

A composition consisting essentially of a vinylidene chloride series resin blended with a graft copolymer obtained by polymerizing 30 to 60 parts by weight of a monomer mixture consisting essentially of 30 to 60% by weight of an aromatic vinyl compound, 10 to 40% by weight of methyl methacrylate, 10 to 40% by weight of acrylic acid ester, and 5 to 20% by weight of acrylonitrile, in 40 to 70 parts by weight of a butadiene rubber latex.

3,814,709
LACQUER BINDERS ESPECIALLY SUITABLE FOR ELECTRODEPOSITION BASED ON MALEINIZED POLYBUTADIENE OILS

Hans-Jurgen Meissner, Krefeld-Bockum, Rolf Dhein, Krefeld, and Rolf Kuchenmeister, Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of application Ser. No. 239,690, Mar. 30, 1972, which is a continuation-in-part of application Ser. No. 119,863, Mar. 1, 1971, both now abandoned. This application July 10, 1973, Ser. No. 378,040
Claims priority, application Germany, Apr. 4, 1970, P 20 16 223.6; Apr. 7, 1971, P 21 16 975.5
Int. Cl. C09d *3/00*
U.S. Cl. 260—23.7 A **3 Claims**

Polymeric products based on polybutadiene oil having a viscosity of 3–100 poise at 20° C., an unsaturated fatty acid ester, maleic anhydride and, optionally, an ethylenically unsaturated monomer, said product being characterized by an acid viscosity over 30,000 poise at 20° C. and the use thereof after hydrolysis and salt formation as a lacquer binder in the form of an aqueous dispersion.

3,814,710
POLISH COMPOSITIONS

David Gray Duncan, Newfarmloch, Scotland, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation of application Ser. No. 298,391, Oct. 17, 1972, which is a continuation of application Ser. No. 102,070, Dec. 28, 1970, both now abandoned. This application Sept. 27, 1973, Ser. No. 401,376
Claims priority, application Great Britain, Jan. 14, 1970, 1,835/70
Int. Cl. C08g *51/52*
U.S. Cl. 260—28 **9 Claims**

Improved weather and detergent resistant polish especially for motor cars, consisting of the conventional constituents with a proportion of a hydroxy-ended organopolysiloxane and an aminoalkoxysiloxane catalyst therefor and with or without a proportion of a silicone fluid as used hitherto.

3,814,711
10-ACETAMIDO-*s*-TRIAZOLO-[3,4-*a*]-ISOQUINOLINES

Fernand G. F. Eloy, Rhode St. Genese, Belgium, and Morton E. Goldberg, Glen Rock, N.J., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Filed July 26, 1971, Ser. No. 164,881
Int. Cl. C07d *33/56*
U.S. Cl. 260—287 R **1 Claim**

Novel *s*-triazolo-[3,4-*a*]-isoquinoline compounds are prepared by methods analogous to known methods and exhibit anti-aggressive activity.

3,814,712

ADHESIVES COATINGS AND LAMINATES UTILIZING ETHYLENE COPOLYMERS AND COAL-TAR PITCH

George F. Snyder, Franklin Township, Westmoreland County, and Robert M. Stewart, Monroeville Borough, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of abandoned application Ser. No. 692,295, Dec. 21, 1967. This application Nov. 24, 1971, Ser. No. 201,861

Int. Cl. C08f 45/52

U.S. Cl. 260—28.5 AS 16 Claims

Thermoplastic compositions of matter comprising coal-tar pitch and a material selected from (1) a terpolymer of ethylene, vinyl acetate, and an ethylenically-unsaturated carboxylic acid and (2) a mixture of copolymers of ethylene and vinyl acetate and of ethylene and an ethylenically-unsaturated carboxylic acid, exhibiting high strength in shear and peel over a wide temperature range, are prepared and used as adhesives and coatings. Laminated materials utilizing such compositions of matter are also disclosed.

3,814,713

ADHESIVE COMPOSITION

Toshio Honda and Eishi Kubota, Tokyo, Shoji Tanaka, Tokorozawa, and Yukio Fukuura, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

No Drawing. Filed Dec. 3, 1971, Ser. No. 204,703

Claims priority, application Japan, Dec. 4, 1970, 45/106,765; Dec. 15, 1970, 45/111,119

Int. Cl. C08d 7/04; C08g 5/10, 37/18

U.S. Cl. 260—29.3 6 Claims

New adhesive composition for bonding rubber material to any of various materials inclusive synthetic and natural polymers, metals and even silicate and ceramic materials with only a single application. It comprises essentially a rubber latex, a high molecular weight resorcin-formaldehyde resin and a low molecular weight resorcin-formaldehyde resin. The third component contains unreacted resorcin less than 15 weight percent, and preferably less than 10 weight percent and more preferably less than 5 weight percent. For the purpose of adjusting the amount of unreacted resorcin, the low molecular weight resorcin-formaldehyde resin is dissolved in a monoketone of

in which R_1 means an aliphatic hydrocarbon radical and R_2 means an aliphatic or aromatic hydrocarbon radical, from which unreacted resorcin is removed by and by according to repeated water extractions.

3,814,714

INDAZOLE PRESERVATIVES FOR AQUEOUS SYNTHETIC RESIN CONTAINING COMPOSITIONS

Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Continuation-in-part of abandoned application Ser. No. 201,194, Nov. 22, 1971. This application Apr. 24, 1972, Ser. No. 247,084

The portion of the term of the patent subsequent to Dec. 18, 1990, has been disclaimed

Int. Cl. C08d 11/00; C08f 45/64; C09d 5/14

U.S. Cl. 260—29.6 MN 18 Claims

Aqueous compositions that are subject to decomposition and spoilage by the action of bacteria are preserved by incorporating in them a small amount of a biocidal indazole.

3,814,715

GLASS FIBER SIZE CONTAINING POLYOLEFIN EMULSION

Charles E. Nalley, Shelby, and Joseph B. Lovelace, Forest City, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Original application May 21, 1969, Ser. No. 826,715, now Patent No. 3,655,353. Divided and this application Feb. 4, 1972, Ser. No. 223,769

Int. Cl. C08f 45/24

U.S. Cl. 260—29.6 XA 1 Claim

An aqueous forming size for treating a glass fiber strand, said size consisting essentially of a polypropylene emulsion, a textile lubricant and a coupling agent. The polypropylene emulsion can contain some emulsified polyethylene. The sized strands can be further coated with an aqueous rubber adhesive composition in preparation for use as reinforcement for rubber.

3,814,716

LATEX POLYMERS

Edward W. Kowalski, Copenhagen, Denmark, Marion F. Plesich, Ossining, N.Y., and Edmund A. Zavaglia, Wayne, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Mar. 30, 1970, Ser. No. 23,992, now Patent No. 3,729,438. Divided and this application Sept. 8, 1972, Ser. No. 287,441

Int. Cl. C08f 1/13, 15/40

U.S. Cl. 260—29.6 T 11 Claims

Latex polymers comprising an aqueous dispersion of an interpolymer selected from the class consisting of (A) a copolymer of vinyl acetate and vinyl hydrolyzable silane and (B) a terpolymer of vinyl acetate, an ester, e.g. acrylic ester, maleic ester or fumarate ester, and vinyl hydrolyzable silane, as well as the crosslinked polymers derived therefrom; said latex polymers having utility as protective surface coatings and as vehicles for paint formulations.

3,814,717

POLY(CARBOXYLIC ACID)-FLUOROALUMINOSILICATE GLASS SURGICAL CEMENT

Alan Donald Wilson and Brian Ernest Kent, both % The Dental Materials Section, Laboratory of the Government Chemist, Cornwall House, Stamford St., London SE. 1, England

No Drawing. Filed Dec. 4, 1970, Ser. No. 95,417

Int. Cl. A61k 5/00; C08f 29/34

U.S. Cl. 260—29.6 M 47 Claims

A surgical cement pack comprises as one component a fluoroaluminosilicate glass powder wherein the ratio by weight of silica to alumina is from 1.5 to 2.0 and the ratio by weight of fluorine to alumina is from 0.6 to 2.5, or wherein the ratio by weight of silica to alumina is from 0.5 to 1.5 and the ratio by weight of fluorine to alumina is from 0.25 to 2.0, and as another component a surgically acceptable water soluble poly(carboxylic acid) having a relative viscosity of from 1.05 to 2.00.

The poly(carboxylic acid) is preferably in the form of an aqueous solution. On mixing the fluoroaluminosilicate glass powder and the aqueous solution of the poly(carboxylic acid) there is obtained a mass that remains plastic long enough to be formed into a desired shape prior to hardening as a surgical cement.

3,814,718

THERMOSETTING MOULDING COMPOSITIONS

Wolfram Busch, Massenheim-Gartenstadt, and Stefan Mullner, Niederhofheim, Germany, assignors to Chemische Werke Albert Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Nov. 15, 1972, Ser. No. 306,727

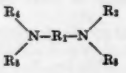
Claims priority, application Germany, Nov. 18, 1971, P 21 57 200.9; Aug. 5, 1972, P 22 38 669.2

Int. Cl. C08f 21/02

U.S. Cl. 260—32.6 R 9 Claims

A thermosetting moulding composition comprising (A) an unsaturated polyester, (B) a copolymerizable mon-

omer, (C) a filler or reinforcing substance, (D) a catalyst and (E) a mould-release agent or a combination thereof with a lubricant and (F) a compound of the formula



(I)

wherein

R_1 is alkylene having 1 to 8 carbon atoms, arylene having 6 to 12 carbon atoms, diarylene-alkane, diarylene-sulphone or cycloalkylene having 5 to 8 carbon atoms, R_2 to R_5 are the same or different and are hydroxyl-terminated poly(oxyalkylene) groups derived from one or more alkylene oxides each containing 2 or 3 carbon atoms, a process for its preparation and a moulded body prepared therefrom.

3,814,719

s-TRIAZINE-IMIDE COPOLYMERS

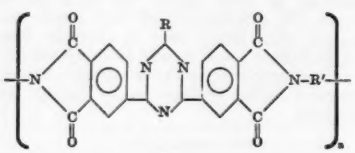
Raymond Seltzer, New City, David A. Gordon, Scarsdale, and Paul D. Sherman, Shrub Oak, N.Y., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed May 1, 1972, Ser. No. 248,837

Int. Cl. C08g *20/32*

U.S. Cl. 260—32.6 N **25 Claims**

Polyimides having a recurring unit



wherein

R is hydrogen, aryl, carbonyl, amino, diaryl amino or a heterocyclic group and R′ is an aromatic group, are prepared by reacting an aromatic diamine with a s-triazine dianhydride. These polyimides can be fabricated into films, coatings, laminates and the like. The polyimides are also fusible and moldings thus obtained are low in void content.

3,814,720

PROCESS FOR PREPARING A NONAQUEOUS DISPERSION OF THERMOSETTING FILM-FORMING COPOLYMER

David L. Maker and Stephen C. Peng, Rochester, and Arend W. D. Vos, Birmingham, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Mar. 1, 1971, Ser. No. 120,044

Int. Cl. C08g *51/28, 51/32, 53/18*

U.S. Cl. 260—33.4 R **9 Claims**

An active ethenic monomer having a functional epoxy, hydroxy or amide group is copolymerized with another active ethenic monomer in the presence of an alkylated methylolated copolymer of acrylamide or methacrylamide and another ethenic monomer dissolved in a nonaqueous medium. The nonaqueous medium is a miscible mixture of an aromatic or alcoholic solvent for the methylolated copolymer and an aliphatic nonsolvent for the other copolymer. The reaction produces a stable dispersion of a polymeric material that is insoluble in the nonaqueous medium. Curing coatings of the dispersions produces thermosetting films having an excellent combination of protective and decorative properties.

3,814,721

NONAQUEOUS DISPERSIONS OF THERMOSETTING FILM FORMING COPOLYMERS OF ETHENIC MONOMERS

David L. Maker and Stephen C. Peng, Rochester, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Mar. 1, 1971, Ser. No. 120,045

Int. Cl. C08g *51/28, 51/32, 53/18*

U.S. Cl. 260—33.6 R **4 Claims**

A solution of a pecursor addition copolymer is prepared by reacting an active ethenic monomer having a functional epoxy, hydroxy, cyanato or carboxy group with another active ethenic monomer free of functional-groups in an aromatic or alcoholic solvent. A miscible aliphatic liquid is added and a second addition copolymer then is produced by reacting in the mixture a third ethenic monomer having one of such functional groups and a fouth ethenic monomer free of such functional groups. The aliphatic liquid is a nonsolvent for the second addition copolymer which is dispersed through the liquid medium. A melamine-formaldehyde resin having a mineral spirits tolerance of 250 or greater is added. Curing coatings of the dispersion produces thermosetting films having an excellent combination of protective and decorative properties.

3,814,722

HEAT CURABLE POLYSILOXANE COMPOSITIONS CONTAINING FIBERS

Frank J. Glaister, Ballston Spa, Verne G. Simpson, Scotia, and George P. De Zuba, Waterford, N.Y., assignors to General Electric Company, Waterford, N.Y.

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,727

Int. Cl. C08g *5/10*

U.S. Cl. 260—37 SB **23 Claims**

A heat curable silicone rubber composition comprising 5% to 94.75% by weight of an organopolysiloxane polymer, 5 to 75% by weight of a fibrous filler, and 0.25 to 10% by weight of an organic additive compound. The composition also includes a silica filler, a peroxide curing agent and a process aid.

3,814,723

HEAT-SHRINKABLE AND FLAME-RETARDANT SILICONE RUBBER COMPOSITIONS

Kiyoshi Yokokawa and Yasuhisa Tanaka, Annaka, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

No Drawing. Filed July 12, 1972, Ser. No. 271,184

Int. Cl. C08g *51/04, 47/00*

U.S. Cl. 260—37 SB **6 Claims**

Heat-shrinkable and flame-retardant silicone rubber compositions comprising: (1) 100 parts by weight of a diorganopolysiloxane gum consisting of 99.7 mol percent dimethylsiloxy unit and 0.3 mol percent methylvinylsiloxy unit; (2) 43 parts by weight of fume silica; (3) 25 parts by weight of an organopolysiloxane resin consisting of 37 mol percent phenylsiloxy unit, 25 mol percent methylsiloxy unit, 19 mol percent diphenylsiloxy unit, 17 mol percent dimethylsiloxy unit and 2.0 mol percent methylvinylsiloxy unit, and having a softening point of 84–89° C.; (4) 1 part by weight of trimethylsilyl end-stopped methyl-hydrogen polysiloxane; and (5) catalytic amount of chloroplatinic acid. These compositions are molded into various shapes and cured. The molded and cured articles are stretched at a certain temperature and then cooled to room temperature in their stretched condition. The resulting articles have such properties as distinguished in heat-shrinkage, flame-retardancy, mechanical strength, water proofness, and electrical properties.

3,814,724
POLYMERIZABLE LIQUID COMPOSITIONS FOR UNSATURATED POLYESTER RESINS

Hiroshi Suzuki, Chiba, and Makoto Iriuchijima, Koichi Nakamura, and Kazuharu Yagi, Saitama, Japan, assignors to Maruzen Oil Company, Osaka, Japan

No Drawing. Filed Feb. 13, 1973, Ser. No. 331,733
Int. Cl. C08f 21/00, 21/02
U.S. Cl. 260—40 R 25 Claims

A polymerizable liquid composition for use in preparing a thermosetting unsaturated polyester resin having a high chemical resistance, especially high alkali resistance, and a cured product obtained therefrom. The liquid composition essentially comprises (a) a polycondensate obtained by reacting (i) 2-methylbutane-1,3-diol, (ii) terephthalic acid, isophthalic acid and/or esters thereof and (iii) an unsaturated dicarboxylic acid, and (b) an ethylenically unsaturated monomer.

3,814,725
POLYALKYLENE TEREPHTHALATE MOLDING RESIN

Daniel Zimmerman, East Brunswick, and Robert B. Isaacson, Springfield, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 854,259, Aug. 29, 1969. This application June 26, 1973, Ser. No. 373,834
Int. Cl. C08g 51/04
U.S. Cl. 260—40 R 18 Claims

An improved molding resin comprising a reinforcing filler and a polypropylene terephthalate or a polybutylene terephthalate and process for producing same.

3,814,726
PROCESS FOR COLORING PRODUCTS OF HIGH MOLECULAR WEIGHT WITH PIGMENTS

Paul Hugelshofer and Fritz Kugler, Muttenz, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation of application Ser. No. 98,115, Dec. 14, 1970, which is a continuation-in-part of application Ser. No. 760,082, Sept. 16, 1968, both now abandoned. This application June 1, 1972, Ser. No. 258,641
Int. Cl. C08f 45/14; C09b 3/30
U.S. Cl. 260—42.21 3 Claims

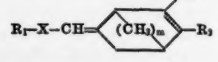
Dibenzanthrone sulfonamides or isodibenzanthrone sulfonamides are useful for coloring high-molecular organic products in violet shades having excellent fastness properties.

3,814,727
OZONE-RESISTANT ODORLESS VULCANIZATES

Peter Hartmann, Cologne, Wolfgang Redetzky, Opladen-Quettingen, and Klaus Wagner, Ernst Roos, and Theo Kempermann, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 13, 1972, Ser. No. 288,746
Claims priority, application Germany, Sept. 16, 1971, P 21 46 263.5
Int. Cl. C08c 11/32, 11/44, 11/54
U.S. Cl. 260—45.9 R 8 Claims

Object of the invention is a process for the production of odorless ozone-resistant rubber articles by adding to the anti-ozonant of the general formula



a deodorant of the formula

$$R—CO—NH—NH_2$$

The deodorant enables the troublesome natural odor to be completely eliminated.

3,814,728
STABILIZATION OF POLYAMIDE

Carlton Ray Bostic, Hixson, and John Maxwell Davis, Signal Mountain, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 197,920, Nov. 11, 1971, which is a continuation of application Ser. No. 74,871, Sept. 23, 1970, which in turn is a continuation-in-part of application Ser. No. 714,444, Mar. 2, 1968, all now abandoned. This application May 19, 1972, Ser. No. 255,199
Int. Cl. C08g 51/62
U.S. Cl. 260—45.75 C 10 Claims

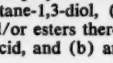
A process for minimizing thermal degradation of fiber forming polyamide in the molten state.

3,814,729
METHOXY CARBOXYLIC ACID ESTER ULTRAVIOLET STABILIZERS FOR POLYMERS

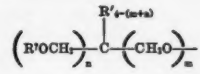
Robert G. Gouch, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

No Drawing. Filed Oct. 13, 1972, Ser. No. 297,446
Int. Cl. C08f 45/58
U.S. Cl. 260—45.85 B 12 Claims

Compounds of the formula



are prepared and are used as ultraviolet light and weathering stabilizers for polymers, preferably polypropylene. In the formula R is alkoxyphenyl, dialkoxyphenyl or alkylene dioxyphenyl, the alkoxy groups have 1 to 8 carbon atoms and the alkylene group has 1 to 4 carbon atoms, q is 1 to 6, and Z is



where R' is H or a 1 to 4 carbon alkyl, R^7 is

where R^8 is hydrocarbyl, m is 1 to 4, n is 0 or 1 and $m+n$ is 1 to 4.

3,814,730
PLATINUM COMPLEXES OF UNSATURATED SILOXANES AND PLATINUM CONTAINING ORGANOPOLYSILOXANES

Bruce D. Karstedt, Charlotte, N.C., assignor to General Electric Company, Waterford, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 61,822, Aug. 6, 1970, which is a division of application Ser. No. 861,199, Sept. 25, 1969, which in turn is a continuation-in-part of application Ser. No. 598,216, Dec. 1, 1966, all now abandoned. This application Feb. 16, 1972, Ser. No. 226,928
The portion of the term of the patent subsequent to Feb. 6, 1990, has been disclaimed and dedicated to the Public
Int. Cl. C08f 11/04
U.S. Cl. 260—46.5 UA 9 Claims

Platinum complexes of unsaturated siloxanes are provided which are useful as hydrosilation catalysts. These platinum-siloxane complexes must contain less than about 0.1 gram atom of halogen, per gram atom of platinum, and preferably substantially free of halogen which include platinum-siloxane complexes which are substantially free of inorganic halogen. These platinum-siloxane complexes can be made by effecting contact between a platinum halide and an unsaturated siloxane, for example, 1,3-divinyltetramethyldisiloxane, and removing available inorganic halogen from the resulting material. In addition, curable organopolysiloxane compositions are provided comprising an organopolysiloxane polymer and an effective amount of such platinum-siloxane complex.

3,814,731
AGENTS FOR THE MANUFACTURE OF NON-STICK COATINGS
Siegfried Nitzsche and Heinrich Marwitz, Burghausen, and Friedrich Hockemeyer, Reischach, West Germany, assignors to Wacker-Chemie GmbH, Munich, Germany
No Drawing. Filed June 22, 1972, Ser. No. 265,115
Claims priority, application Germany, June 25, 1971, P 21 31 740.8
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 UA 5 Claims

A non-stick coating composition comprising (1) organopolysiloxanes having silicon bonded vinyl groups as the terminal units, (2) organopolysiloxanes having at least 3 silicon bonded hydrogen atoms per molecule and (3) a curing catalyst obtained from the reaction of chloroplatinic acid and a ketone. The composition may be applied to any solid surface and cured at an elevated temperature to form a non-stick coating thereon.

3,814,732
MODIFIED SOLID SUPPORTS FOR SOLID PHASE SYNTHESIS
Su-Sun Wang, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Oct. 21, 1971, Ser. No. 191,472
Int. Cl. C08f *27/00, 27/08*; C08g *20/08*
U.S. Cl. 260—47 UP 4 Claims

Solid support materials used in the solid phase synthesis of complex organic molecules may be modified by introduction of a p-oxy-benzyl alcohol or a p-oxy-benzyloxycarbonylhydrazide linking group to produce modified supports useful in solid phase preparation of protected product free acids and protected product hydrazides respectively. The resulting protected products are particularly useful in the fragment condensation approach to the synthesis of large, complex organic molecules.

3,814,733
ISOMERIZATION OF (+)-TRANS - 2,3-EPOXY-CIS-CARANE TO (+)-CIS-2,8-p-MENTHADIENE-1-OL
James O. Bledsoe, Jr., John M. Derfer, and Walter E. Johnson, Jr., Jacksonville, Fla., assignors to SMC Corporation, Cleveland, Ohio
No Drawing. Filed July 27, 1970, Ser. No. 58,716
Int. Cl. C07c *35/08*
U.S. Cl. 260—631.5 5 Claims

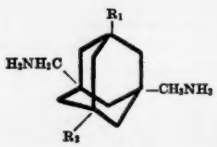
Isomerization of (+)-trans-2,3-epoxy-cis-carane to (+)-cis-2,8-p-menthadiene-1-ol is effected by contacting the epoxy carane with metatitanic acid at a temperature of from 25–200° C., the catalyst concentration being broadly inverse to temperature and restricted for avoidance of dehydration of the menthadiene-1-ol product.

3,814,734
MULTICOMPONENT INTERPOLYMERS HAVING ALTERNATING SEQUENTIAL STRUCTURE
Shohachi Kawasumi, Takatsuki, and Masaaki Hirooka and Hiroshi Yabuuchi, Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
No Drawing. Continuation-in-part of application Ser. No. 170,365, Aug. 9, 1971, which is a continuation of application Ser. No. 7,214, Jan. 30, 1970, which in turn is a continuation-in-part of application Ser. No. 642,702, June 1, 1967, all now abandoned. This application Oct. 18, 1972, Ser. No. 298,780
Claims priority, application Japan, June 6, 1966, 41/36,745
Int. Cl. C08f *9/00, 15/40, 25/00*
U.S. Cl. 260—63 R 28 Claims

A conjugated vinyl compound having a nitrile or carbonyl group in the conjugated position [(B) group monomer] forms a complex with at least one organoaluminum halide or at least one organoboron halide, and this complex reacts with an olefinic monomer [(A) group monomer] to produce an alternating copolymer. The present invention is based on the discovery that when there are a plurality of the (A) group monomers and/or a plurality of the (B) group monomers in said alternating copolymerization system, a multicomponent interpolymer can also be obtained in which the interpolymer essentially has a structure in which monomer units from the (A) group always alternate with monomer units from the (B) group, each monomer unit from the (A) group being linked only to monomer units from the (B) group and each monomer unit from the (B) group being linked only to monomer units from the (A) group. Further the present invention concerns the application of said multicomponent interpolymers and a method for the production thereof.

3,814,735
POLYIMIDE POLYMER OF ALKYLADAMANTANE DIAMINE AND POLYANHYDRIDE
Robert M. Thompson, Wilmington, Del., assignor to Sun Research and Development Co., Marcus Hook, Pa.
Continuation-in-part of abandoned application Ser. No. 191,706, Oct. 22, 1971. This application Nov. 15, 1972, Ser. No. 306,764
Int. Cl. C08g *20/32*
U.S. Cl. 260—65 7 Claims

A novel polymer is prepared by the condensation of an alkyladamantane diamine of the following structure:



where each of R_1 and R_2 is an alkyl radical having 1–10 carbon atoms and one of the following: dianhydride of 1,2,4,5-benzene-tetracarboxylic acid and 3,4,3′,4′-benzophenonetetracarboxylic dianhydride. The resulting polymer is thermally stable at high temperatures and is useful as a fiber, film or sheet.

3,814,736
POLYURETHANE PREPOLYMERS HAVING IMPROVED STABILITY AND METHOD FOR THEIR PREPARATION
Alain Gibier-Rambaud, Chemin des Esperelles, and Bernard Blanc, Bd Gerard Philippe, both of 13-Martigues, France
No Drawing. Continuation of abandoned application Ser. No. 57,336, July 22, 1970. This application Feb. 1, 1973, Ser. No. 328,711
Claims priority, application France, July 25, 1969, 6925423
Int. Cl. C08g *22/44*
U.S. Cl. 260—77.5 AC 9 Claims

Polyurethane prepolymers prepared by the reaction of polyhydroxylated compounds with an excess of organic polyisocyanates in which prior to the admixture of the polyhydroxylated compounds with the polyisocyanates, the former is subjected to a dehydration to reduce the residual water content to less than 5000 and preferably less than 500 p.p.m. and a small amount of a highly hydrolyzable compound such as the chloride of boron, aluminum, titanium and silicon is added and in which the composition may include various adjuvants such as fillers, pigments, coloring agents and solvents which are dehydrated prior to admixture.

3,814,737

ETHYLENE-ACRYLIC ACID POLYMERS HAVING IMPROVED OPTICAL CHARACTERISTICS

Ronald E. Gilbert, Orange, Tex., Joseph W. Jones, Jr., Leawood, Kans., and Raymond M. Henry, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 77,027, Sept. 30, 1970. This application Aug. 14, 1972, Ser. No. 280,250

Int. Cl. C08f *15/02*

U.S. Cl. 260—80.73 2 Claims

A fractional precipitation process is employed to substantially improve the optical properties of ethylene-acrylic acid polymers.

3,814,738

METHYLSTYRENE/STYRENE/ISOBUTENE TERPOLYMER RESINS AND PROCESS FOR THEIR MANUFACTURE

Leander Feller, Gersthofen, and Helmut Korbanka, Adelsried, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Nov. 13, 1972, Ser. No. 305,668

Claims priority, application Germany, Nov. 18, 1971, P 21 57 231.6

Int. Cl. C08f *19/00*

U.S. Cl. 260—80.78 2 Claims

There are disclosed and claimed novel terpolymers of α-methylstyrene, styrene and isobutene having excellent properties which enable them especially to be used in the adhesives and coatings field, as well as the method for preparing said terpolymers.

3,814,739

METHOD OF MANUFACTURING FIBERS AND FILMS FROM AN ACRYLONITRILE COPOLYMER

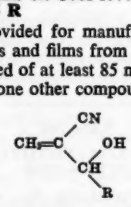
Hiromu Takeda, Otsu, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Original application Dec. 27, 1971, Ser. No. 212,374, now Patent No. 3,758,659. Divided and this application Apr. 12, 1973, Ser. No. 350,327

Int. Cl. C08f *15/22*

U.S. Cl. 260—85.5 R 1 Claim

A method is provided for manufacturing shaped articles especially fibers and films from a solvent solution of copolymer comprised of at least 85 mol percent of acrylonitrile and at least one other compound of the formula



wherein R is hydrogen, an alkyl group, an aryl group or alkylaryl group. In the method of this invention the solvent solution is shaped and thereafter coagulated in a bath comprised of at least 60% by weight of methanol. The shaped articles, for example, filaments, because of their superior properties, are especially useful as textile fibers.

3,814,740

PREPARATION OF METHACRYLATE COPOLYMERS

Robert S. Miller, Bridgewater, N.J., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed July 13, 1972, Ser. No. 271,451

Int. Cl. C08f *15/18, 45/24*

U.S. Cl. 260—86.1 E 13 Claims

This process provides for the preparation of copolymers of methyl methacrylate with up to 20 mol percent of an acrylate ester, the process comprising reacting the monomers in an aqueous emulsion in the presence of a water-soluble free radical catalyst, an emulsifying agent and a chain transfer agent, wherein the temperature is maintained at from about 50 to about 70° C. until from 40 to 60 mol percent of the monomers have reacted and then increasing temperatures to 70 to 100° C. The polymer is preferably spray-dried to a particle size of not greater than about 450 microns.

3,814,741

ACRYLIC AND METHACRYLIC MONOMERS, POLYMERS AND COPOLYMERS THEREOF

Gerardo Caporiccio, Milan, and Ezio Strepparola, Treviglio, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Original application Jan. 21, 1971, Ser. No. 108,573, now Patent No. 3,766,251. Divided and this application Feb. 22, 1973, Ser. No. 334,637

Claims priority, application Italy, Jan. 24, 1970, 19,750/70

Int. Cl. C08f *3/64, 3/66, 15/16*

U.S. Cl. 260—86.1 E 9 Claims

A new class of polymers comprising a main carbon chain and having polyfluoropolyether side groups. The polymers possess excellent soil and water resistant properties and are useful for rendering fabrics soil and moisture resistant. The polymers are prepared from a new class of polymerizable polyfluorinated polyether acrylates, methacrylates, acrylamides and methacrylamides. A new class of alcohols, useful for preparing the acrylate and methacrylate monomers is disclosed and methods for preparing the alcohols, monomers and polymers are disclosed.

3,814,742

ACRYLAMIDE-STYRENE COPOLYMERIZATION BY HIGH-SPEED SHEAR AGITATION OF AQUEOUS MEDIUM CONTAINING POLYACRYLAMIDE

Daniel Elmer Nagy, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 23, 1973, Ser. No. 344,464

Int. Cl. C08f *15/02*

U.S. Cl. 260—88.1 PN 7 Claims

Acrylamide is copolymerized with styrene in oxygen-free aqueous medium containing a styrene-soluble initiator and 0.2%–2% by weight of a polyacrylamide having a molecular weight above 500,000, the mixture being agitated by a shear-type stirrer having a tip-speed above 15 ft./sec.

3,814,743

PROCESS FOR POLYMERIZING ALPHA-OLEFINS

Erik Tornqvist, Roselle, and Arthur W. Langer, Jr., Watchung, N.J., assignors to Esso Research and Engineering Company

Continuation of abandoned application Ser. No. 151,522, Nov. 10, 1961, which is a division of application Ser. No. 745,124, June 27, 1958, now Patent No. 3,032,510. This application Nov. 13, 1964, Ser. No. 412,287

Int. Cl. C08f *1/42, 3/10*

U.S. Cl. 260—93.7 14 Claims

High polymerization rates for alpha-olefins are obtained by dry milling a preformed partially reduced transition metal halide alone or cocrystallized with a Group II or III metal halide prior to activation with an organometallic compound. Examples of the transition metal halide are purple crystalline titanium trichloride and purple crystalline titanium trichloride cocrystallized with aluminum trichloride.

3,814,744

PROCESS FOR PRODUCING BUTADIENE POLYMER

Yoshiharu Yagi, Toyonaka, Shizuo Narisawa and Takao Oshima, Ibaragi, and Kazuhiko Hata, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited

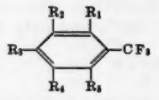
No Drawing. Filed Sept. 21, 1971, Ser. No. 182,536

Claims priority, application Japan, Sept. 24, 1970, 45/84,377; Oct. 17, 1970, 45/91,355

Int. Cl. C08d *1/14, 3/06*

U.S. Cl. 260—94.3 13 Claims

A process for producing butadiene polymer which comprises polymerizing 1,3-butadiene in the presence of a catalyst system consisting of (A) at least one of nickel compounds, (B) at least one of trialkyl aluminum compounds, (C) at least one of benzotrifluoride compounds of the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are each a hydrogen atom, a halogen atom, an alkyl group or a fluoroalkyl group and (D) at least one carboxylic compound selected from the group consisting of carboxylic acids of the formula:

$$R_x—COOH$$

wherein R_x is a chlorinated or fluorinated alkyl group, carboxylic acid esters of the formula:

$$R_x—COOR$$

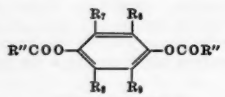
wherein R is a hydrocarbon group or a halogenated hydrocarbon group and R_x is as defined above, carboxylic acid anhydrides of the formula:

$$(R_x—CO)_2O$$

wherein R_x is as defined above, alkylaluminum carboxylates of the formula:

$$(R_x—COO)_nAlR'_{3-n}$$

wherein R′ is an alkyl group, *n* is an integer not more than 3 and R_x is as defined above and hydroquinone carboxylates of the formula:



wherein R_6, R_7, R_8 and R_9 are each a hydrogen atom or a halogen atom and R″ is a hydrocarbon group or a halogenated hydrocarbon group with or without (E) water to give a butadiene polymer containing predominantly cis-1,4-structure.

3,814,745

PEROXIDE TREATED PROTEIN PHOSPHATE COMPLEX

Nicholas Melachouris, Hartsdale, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Apr. 20, 1972, Ser. No. 246,003

Int. Cl. C07g *7/00;* A21d *2/26;* A23j *1/20*

U.S. Cl. 260—112 R 15 Claims

Peroxide treated proteins which are subsequently complexed with polyphosphates have been found to be effective as total or partial replacements for the high heat nonfat dried milk normally used in bread.

3,814,746

MANNICH BASE OF TETRACYCLINE AND POLYPEPTIDES

Augusto De Barbieri, Milan, Italy, assignor to Instituto Sieroterapico Milanese "Serafino Belfanti" Ente Morale, Milan, Italy

No Drawing. Filed Dec. 3, 1970, Ser. No. 94,950

Claims priority, application Italy, Aug. 5, 1970, 28,334/70

Int. Cl. C07c *103/52, 103/19*

U.S. Cl. 260—112.5 7 Claims

Tetracycline derivates of synthetic peptides having m-di(2-chloroethyl)amino-phenyl-L-alanine linked through one or more peptide bonds to one or more specified amino-acids, are effective in the treatment of tumors in man and other animals.

3,814,747

N-TRIHALOACETYL ASPARTIC ACID DIPEPTIDE ESTER SWEETENING AGENTS

Milton Lapidus, Rosemont, and Marian M. McGettigan, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Oct. 16, 1970, Ser. No. 81,533, now Patent No. 3,725,453. Divided and this application Aug. 7, 1972, Ser. No. 278,513

Int. Cl. C07c *103/52;* A23l *1/26*

U.S. Cl. 260—112.5 3 Claims

Disclosed herein are derivates of L-aspartic acid which have utility as artifical sweetener agents. Also disclosed is a method for producing such derivatives.

3,814,748

PROCESS FOR PRODUCING COTTONSEED PROTEIN ISOLATES

Robert L. Olson and Dean R. Frazeur, Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

No Drawing. Filed Feb. 25, 1972, Ser. No. 229,582

Int. Cl. A23j *1/14*

U.S. Cl. 260—123.5 3 Claims

Cottonseed flour or flakes are extracted for a short time with alkali and the extract is acidified to a pH in the range of 7.0 to 8.0 to produce a major protein isolate substantially devoid of objectionable color.

3,814,749

BLUE PHENYLAZONAPHTHYLAZO-N-ARYL PERI ACIDS

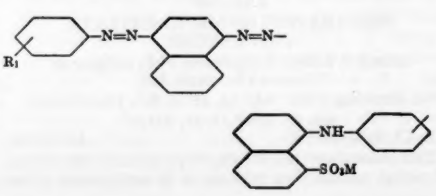
James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 816,095, Apr. 14, 1969. This application Dec. 22, 1971, Ser. No. 211,097

Int. Cl. C09b *31/04;* D06p *3/24*

U.S. Cl. 260—190 5 Claims

New compounds having the structure



wherein M is —H, —Na, —K or —NH_4; R_1 is —H, —CH_3, or —Cl and R_2 is —H, —CH_3 or —OCH_3 are useful as blue dyes for natural and synthetic polyamides and for spandex fibers.

3,814,750

BASIC ETHERS OF 1-PHENYL-2-(2-THIENYL) ETHANOLS

Peter Edward Cross, Canterbury, and Roger Peter Dickinson, Worth, near Deal, England, assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed June 23, 1972, Ser. No. 265,631

Claims priority, application Great Britain, July 14, 1971, 32,956/71

Int. Cl. C07d *63/12*

U.S. Cl. 260—239 B **4 Claims**

Benzyl- and thenyl analogs of diphenhydramine and acid addition salts thereof useful as gastric anti-secretory agents, and methods for their preparation are described.

3,814,751

PROCESS FOR PREPARING 6,6-DIFLUORO-17α,21-DIHYDROXY 16α-METHYL - 4-PREGNENE-3,20-DIONE

George Albert Boswell, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 4, 1973, Ser. No. 366,880

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R **4 Claims**

The process involves heating a 21-bromo steroid compound, such as 21-bromo - 5α,6,6 - trifluoro-3β,17-α-dihydroxy-16α-methylpregnan - 20 - one, with anhydrous alkali metal alkanoate, such as sodium acetate, in the presence of a solvent for both the steroid compound and the alkali metal alkanoate, to replace the bromine atom with an acyl group. The resulting 21-ester steroid is itself an intermediate in the production of known biologically active steroid compounds.

3,814,752

6,6'-METHYLENEBIS[2-STYRYL BENZOPYRYLIUM SALT] AS SENSITIZERS FOR USE IN ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

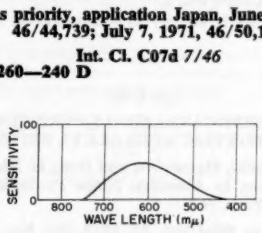
Shoji Maruyama, Sagamihara, Katue Kojima, Tomio Kubota, and Masahide Harada, Tokyo, and Masafumi Ohta, Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed June 5, 1972, Ser. No. 259,392

Claims priority, application Japan, June 21, 1971, 46/44,739; July 7, 1971, 46/50,171

Int. Cl. C07d *7/46*

U.S. Cl. 260—240 D **6 Claims**



There are provided sensitizers for use in an electrophotographic light-sensitive material containing an organic photoconductor. The sensitizers comprise derivatives of 6,6'-methylenebisbenzopyrylium salts.

3,814,753

MONOMETHYLOL AND DIMETHYLOL TRIAZONE SULFAMIC ACID, AND SALTS THEREOF

Andrew A. Kasper, Watertown, Mass., assignor to The Kendall Company, Walpole, Mass.

No Drawing. Filed Apr. 11, 1972, Ser. No. 243,081

Int. Cl. C07d *55/12*

U.S. Cl. 260—242 **14 Claims**

Monomethylol and dimethylol triazone sulfamic acid and the sodium, potassium, lithium, calcium, magnesium, zinc, aluminum and ammonium salts thereof are disclosed. Compositions containing the salts and acidic catalysts impart creaseproofing properties to cellulosic textiles.

3,814,754

CLEAVAGE OF 7-ACYLAMINO CEPHALOSPORINS

Billy G. Jackson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 805,823, Mar. 10, 1969. This application June 10, 1971, Ser. No. 151,993

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **5 Claims**

Trichloroethyl and *p*-nitrobenzyl esters of 3-methyl-7-acylamido cephalosporins are converted to the corresponding 3-methyl-7-amino esters by treatment with water or a lower alkanol in the presence of a strong acid.

3,814,755

7 - (*o* - AMINOMETHYLPHENYLACETAMIDO)-3-(TETRAZOLO[4,5 - b]PYRIDAZIN - 6 - YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

Takayuki Naito, Tokyo, and Jun Okumura and Hajime Kamachi, Yokohama, Japan, assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Aug. 30, 1972, Ser. No. 284,792

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **7 Claims**

7 - (*o* - aminomethylphenylacetamido) - 3 - (tetrazolo-[4,5-b]pyridazin - 6 - ylthiomethyl)-3-cephem-carboxylic acid and its nontoxic, pharmaceutically acceptable salts and especially its dimethanesulfonate derivative are valuable as antibacterial agents, as nutritional supplements in animal feeds and as therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by many Gram-positive and Gram-negative bacteria. 7-(*o*-aminomethylphenylacetamido) - 3 - tetrazolo[4,5-b]pyridazin-6-ylthiomethyl)-3-cephem-4-carboxylic acid is prepared, for example, by treatment at 0° C. with trifluoroacetic acid of the corresponding compound in which the free amino group is protected with a *tert.*-butoxycarbonyl group.

3,814,756

DERIVATIVES OF 1,2-DIHYDRO-2-OXO-4-AMINO-PYRIMIDO[4,5-b]QUINOXALINE - 5,10-MICRON-DIOXIDES

Florin Seng, Cologne, Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 2, 1972, Ser. No. 249,702

Claims priority, application Germany, May 7, 1971, P 21 22 571.8

Int. Cl. C07d *51/46*

U.S. Cl. 260—247.2 A **10 Claims**

1,2-dihydro-2-oxo-4-aminopyrimido[4,5-b]quinoxaline-5,10-dioxides demonstrate antimicrobial activity and can

be used as such or in compositions for combatting infections and in improving feed efficiency. The compounds, of which 1,2-dihydro-2-oxo-4-dimethylaminopyrimido[4,5-b] quinoxaline-5,10-dioxide is a typical embodiment, are prepared from the appropriate 3-aminoquinoxaline-1,4-dioxide-2-amidine and phosgene or an alkyl chloroformate followed by treatment with base.

3,814,757

DIAMINO SUBSTITUTED DICYANO PYRAZINES AND PROCESS

Dennis Scott Donald, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 133,724, Apr. 13, 1971. This application Mar. 6, 1972, Ser. No. 232,207

Int. Cl. C07d *51/76*

U.S. Cl. 260—250 R **6 Claims**

Certain novel dicyano- and tricyano-pyrazines are obtained by replacing one or two cyano groups of tetracyanopyrazine. The compounds are fluorescent and can be used to prepare polymers.

3,814,758

NITROFURYL PYRIMIDINE DERIVATIVES

Rudolf Albrecht, Hans-Joachim Kessler, and Eberhard Schröder, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

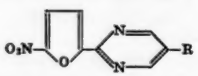
No Drawing. Filed Aug. 12, 1970, Ser. No. 63,336

Claims priority, application Germany, Aug. 13, 1969, P 19 41 575.9

Int. Cl. C07d *51/38*

U.S. Cl. 260—251 R **8 Claims**

Nitrofuryl-pyrimidines of the formula



wherein R is an alkyl or alkoxy group substituted by an hydroxy group esterified by an N-alkylcarbamic acid; a monoester of carbonic acid, an alkylsulfonic acid, benzenesulfonic acid or toluenesulfonic acid, are active against *Trichomonas vaginalis.*

3,814,759

IMIDAZO, PYRIMIDO AND DIAZEPINO BENZOTHIAZOLECARBOXYLIC ACID ESTERS

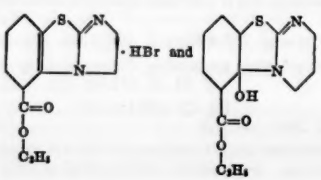
Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 17, 1971, Ser. No. 125,377

Int. Cl. C07d *51/46*

U.S. Cl. 260—251 A **4 Claims**

Imidazo, pyrimido and diazepino benzothiazolecarboxylic acid esters,



3,814,760

PIPERAZINO QUINAZOLINE BRONCHODILATORS

Timothy H. Cronin, Niantic, and Hans-Jurgen E. Hess, Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Original application July 17, 1970, Ser. No. 55,964, now Patent No. 3,723,434. Divided and this application Dec. 15, 1972, Ser. No. 315,617

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.4 Q **4 Claims**

A series of novel 4-piperazino-6,7-dialkoxyquinazolines and 1-piperazino-6,7-dialkoxyisoquinolines have been prepared, including their acid addition salts. These compounds are useful in therapy as bronchodilators and as smooth muscle relaxants. Methods for their preparation from known compounds are provided.

3,814,761

(2-PYRIMIDINYLTHIO)ALKANOIC ACIDS, ESTERS, AMIDES AND HYDRAZIDES

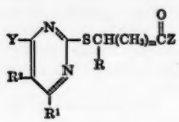
Arthur A. Santilli, Havertown, Anthony C. Scotese, King of Prussia, and Rudolph M. Tomarelli, Phoenixville, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 31, 1972, Ser. No. 240,266

Int. Cl. C07d *51/36*

U.S. Cl. 260—256.5 R **28 Claims**

(2-pyrimidinylthio)alkanoic acids, esters, amides and hydrazides as well as various 4- and 6-substituted derivatives thereof as depicted by the structural formula:



in which

R and R^2 are independently —H or lower alkyl;
R^1 is —H, —halo or lower alkoxy;
Z is —OH, OM, lower alkoxy or $—(NH)_p—NH_2$, wherein *p* is 0 to 1 and M is an alkali metal, alkaline earth metal or ammonium cation;
Y is an aryl, amino or substituted amino radical; and
m is an integer from 0 to 2,
exhibit anti-lipemic activity in warm-blooded animals.

3,814,762

4-THIOSEMICARBAZIDO-5-PYRIMIDINECARBOXYLIC ACID ALKYL ESTERS

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Oct. 30, 1972, Ser. No. 302,304

Int. Cl. C07d *51/36*

U.S. Cl. 260—256.5 R **4 Claims**

2-methylthio and 2-phenyl-4-thiosemicarbazido-5-pyrimidinecarboxylic acid, lower alkyl ester have CNS-depressant activity.

3,814,763

PROCESS FOR MAKING OROTIC ACID

Karl-Josef Boosen, La Neuveville, Bern, Switzerland, assignor to Lonza Ltd., Gampel, Valais, Basel, Switzerland

No Drawing. Continuation of abandoned application Ser. No. 40,701, May 26, 1970. This application Mar. 30, 1973, Ser. No. 346,438
Claims priority, application Switzerland, May 28, 1969, 8,077/69
Int. Cl. C07d 51/38
U.S. Cl. 260—260 2 Claims

Low temperature process for the production of orotic acid from diketene by initial reaction with chlorine to form the gamma-chloroacetoacetic acid chloride followed by reaction with urea to from 4-chloromethyl uracil and oxidation with alkaline hydrogen peroxide.

3,814,764

LOW TEMPERATURE EPOXY CURING ACCELERATORS, SPECIAL TERTIARY AMINE SALTS

Harold A. Green, Havertown, and Robert G. Petrella, Philadelphia, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

No Drawing. Original application Apr. 18, 1969, Ser. No. 818,470, now Patent No. 3,642,649. Divided and this application Feb. 3, 1971, Ser. No. 112,418
Int. Cl. C07d 51/70, 51/72
U.S. Cl. 260—268 T 1 Claim

Low temperature epoxy curing accelerators are prepared from tertiary amine salts of hydrobromic acid, paratoluene sulfonic acid, 2-ethylhexoic acid or thiocyanic acid, wherein the tertiary amine is either triethylene diamine, methyl triethylene diamine or 2 - ethyl - 4 - methyl imidazole.

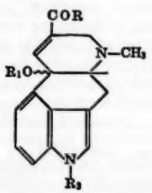
3,814,765

8,9-DIDEHYDRO-10-ALKOXY-ERGOLENES AND PROCESS OF PREPARATION THEREOF

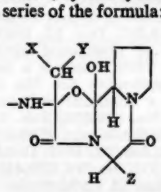
Luigi Bernardi, Bianca Patelli, and Aldemio Temperilli, Milan, Italy, assignors to Societá Farmaceutici Italia, Milan, Italy

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,385
Claims priority, application Italy, Nov. 12, 1970, 54,660/70
Int. Cl. C07d 43/20
U.S. Cl. 260—268 PE 13 Claims

A compound of the formula:



wherein R is selected from the group consisting of alkoxy, amino, substituted amino, cycloalkylamino and a complex amine of the ergot series of the formula:



wherein X and Y are selected from the group consisting of H and CH_3 and Z is selected from the group consisting of benzyl, isopropyl and isobutyl radical; R_1 represents a linear aliphatic alkyl of from 1 to 4 carbon atoms, and R_2 is selected from the group consisting of hydrogen and of an alkyl having from 1 to 4 carbon atoms.

Also described is a process for making these compounds which are readily convertible into the corresponding 8 substituted-10β-alkoxy-ergoline derivatives.

3,814,766

11-DEOXOGLYCYRRHETINIC ACID PIPERAZIDES USEFUL AS ANTIULCER AGENTS

Hans-Jurgen E. Hess, Old Lyme, and Roger P. Nelson, Waterford, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed Nov. 3, 1971, Ser. No. 195,495
Int. Cl. C07d 51/70
U.S. Cl. 260—268 PC 8 Claims

Amide derivatives of 11-deoxoglycyrrhetinic acid and its 3-alkanoyl derivatives where in the amide is derived from ammonia, an alkanolamine, a dialkanolamine, an ω-hydroxyalkyl alkylene diamine, an ω-[bis(hydroxyalkyl)]alkylene diamine, a cyclic amine, a primary or secondary alkylamine or an amino acid are useful as antiulcer agents.

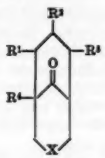
3,814,767

PROCESS FOR PREPARING BICYCLO ALKYL DERIVATIVES

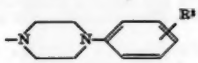
Frederick Edmund Ward, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Apr. 7, 1972, Ser. No. 242,227
Int. Cl. C07d 51/70
U.S. Cl. 260—268 BC 1 Claim

A process for the synthesis of bicyclo alkyl derivatives of the structural formula:

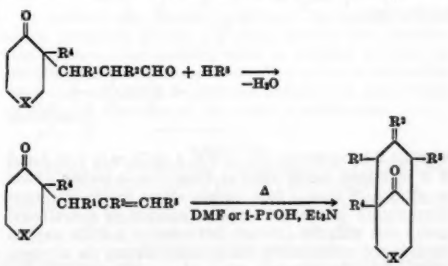


in which R^1 is H or phenyl, R^2 is H or alkyl, R^4 is H, phenyl or substituted phenyl in which the substituents are halogen, alkoxy, or alkyl, R^5 is



or

R^3 is H, halogen, alkoxy or CF^3, and X is a polycarbon lower alkylene radical of between 0 and 2 carbon atoms inclusive, comprising the following reaction sequence:



The compounds prepared according to the process of this invention have beneficial pharmacological properties.

3,814,768

6-METHYLENE-6-DESOXY DIHYDRO MORPHINE AND CODEINE DERIVATIVES AND PHARMACEUTICALLY ACCEPTABLE SALTS

Jack Fishman, New York, N.Y., assignor to Evalina Lewenstein, executrix of the estate of Mozes J. Lewenstein, deceased, New York, N.Y.

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,575
Int. Cl. C07d *43/28*
U.S. Cl. 260—285 11 Claims

A narcotic antagonist selected from the class consisting of 6-methylene-6-desoxy dihydro morphine and codeine derivatives and pharmaceutically acceptable salts thereof which are particularly effective by the oral route and which are also effective when administered parenterally.

3,814,769

CATALYZED RADIOIODINE EXCHANGE

George B. Hoey, Ferguson, and Donald R. Peckels and Philip E. Wiegert, St. Louis, Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Continuation of abandoned application Ser. No. 821,097, May 1, 1969. This application Dec. 27, 1971, Ser. No. 212,662
Int. Cl. C07d *33/36*
U.S. Cl. 260—288 A 11 Claims

Isotopic exchange between radioiodine atoms in an iodide salt and stable iodine atoms bound to aromatic carbon atoms is accelerated by the presence of catalytic amounts of copper, for example, by 2.3×10^{-4} mg. of cupric sulfate per mg. of organic compound. The presence of small amounts of water in the reaction medium further enhances the effect of copper. Not only is the conversion of stable iodinated compounds to their radioiodinated isomers substantially increased in many cases, but also lower temperatures and shorter reaction times are feasible with less risk of damage to heat-sensitive organic compounds thereby broadening the range of useful radioiodinated compounds which can be prepared by isotope exchange. Exemplified are quinolines, tryptophans, benzoic and iocetamic acids.

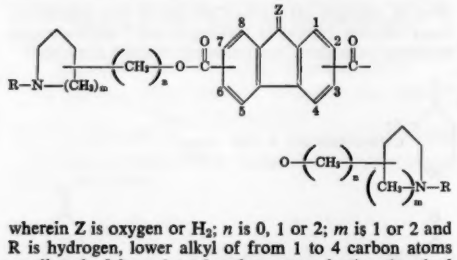
3,814,770

BIS-BASIC ESTERS OF FLUORENE AND FLUORENONE

Edwin R. Andrews and Stephen W. Horgan, Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Filed July 13, 1971, Ser. No. 162,270
Int. Cl. C07d *31/42*
U.S. Cl. 260—293.56 8 Claims

Novel fluorene and fluorenone bis-basic ester compounds, their method of preparation and use as antiviral agents. The compounds are represented by the formula



wherein Z is oxygen or H_2; *n* is 0, 1 or 2; *m* is 1 or 2 and R is hydrogen, lower alkyl of from 1 to 4 carbon atoms or alkenyl of from 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position of the alkenyl group and with the proviso that when *n* is 0 the oxygen atom is not connected to the carbons bearing the nitrogen atom or to the nitrogen atom of the heterocyclic ring. Also included are the acid addition salts of these compounds.

3,814,771

5-PHENYL-2-PIPERIDONES AND 5-PHENYL-2-THIOPIPERIDONES

Tsung-Ying Shen, 858 Willow Grove Road, and Bruce E. Witzel, 206 N. Euclid Ave., both of Westfield, N.J. 07090

No Drawing. Continuation-in-part of application Ser. No. 91,175, Nov. 19, 1970, now Patent No. 3,718,743, which is a continuation-in-part of abandoned application Ser. No. 808,660, Mar. 19, 1969. This application July 19, 1972, Ser. No. 273,233
Int. Cl. C07d *29/36*
U.S. Cl. 260—293.73 3 Claims

Novel 5-phenyl-2-piperidone and 5-phenyl-2-thiopiperidone compounds and the processes for preparing the same are disclosed. In addition the invention concerns piperidones and thiopiperidones which exhibit anti-inflammatory properties and also possess an effective degree of antipyretic and analgesic activity.

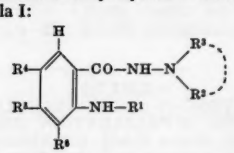
3,814,772

ORTHO-AMINO BENZOYL HYDRAZINE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Jean B. Philippe, Clermont-Ferrand, France, assignor to Ferlux, pres Clermont-Ferrand, France

No Drawing. Filed Sept. 7, 1971, Ser. No. 178,383
Claims priority, application France, Sept. 8, 1970, 7032533
Int. Cl. C07d *29/30*
U.S. Cl. 260—293.77 7 Claims

New *ortho*-amino benzoyl hydrazine derivatives of the general formula I:



(I)

wherein R^1, R^2, R^3, R^4, R^5 and R^6 are selected organic groups, and pharmaceutical preparations containing same as active ingredients, having analgesic, anti-inflammatory and antipyretic action.

A method of manufacturing the hydrazine derivatives of formula I comprises reacting a primary amine with *ortho*-halogenobenzoic acid at reflux in an organic solvent in the presence of potassium carbonate and cupric acetate, collecting the *ortho*-amino benzoic acid derivative thus formed, reacting said benzoic acid derivative with phosgene in a basic environment to form an isatoic anhydride derivative which is collected and reacted with hydrazine or a substituted hydrazine.

3,814,773

INDOLE FUSED HETEROCYCLIC ANTI-INFLAMMATORY COMPOUNDS

David R. Herbst, Wayne, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

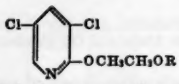
No Drawing. Application May 19, 1970, Ser. No. 38,913, which is a continuation-in-part of abandoned application Ser. No. 889,867, Dec. 22, 1969, which is a continuation-in-part of abandoned application Ser. No. 839,629, July 7, 1969, which is a continuation-in-part of abandoned application Ser. No. 632,105, Apr. 19, 1967, which is a continuation-in-part of abandoned application Ser. No. 536,076, Feb. 21, 1966, which in turn is a continuation-in-part of abandoned application Ser. No. 428,842, Jan. 28, 1965. Divided and this application Aug. 10, 1972, Ser. No. 279,412
Int. Cl. C07d *99/02*
U.S. Cl. 260—295 A 3 Claims

Substituted 2,3,5,6,11,11b-hexahydro - 1H - indolizino [8,7-*b*]indoles, substituted 1,2,3,4,6,7,12,12b-octahydroindolo[2,3-*a*] quinolizines, and 1,3,4,6,7,8,13,13b-octahydro-13,13b-methyl - 2H - pyrido[1',2':1,2]azepino[3,4-*b*]

indole have anti-inflammatory activity. Lactam intermediates for making the compounds are also described.

3,814,774
3,5-DICHLORO-2-PYRIDOXYETHYL ETHERS
Reginald L. Whitaker, Tacoma, Wash., and Herbert Q. Smith, Malvern, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.
No Drawing. Continuation-in-part of abandoned application Ser. No. 115,707, Feb. 16, 1971. This application Aug. 28, 1972, Ser. No. 284,316
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 R **7 Claims**

3,5-dichloro-2-pyridoxyethyl hydrocarbon ether having the structure:



where R is an aliphatic or aromatic radical, is used as a pre-emergent herbicide for crops by applying to the soil, a weed-phytotoxic amount of the ether prior to the emergence of the food crop plants.

3,814,775
3-GLYSIDYL-HYDANTOIN ISOCYANATES
Juergen Habermeier, Pfeffingen, and Daniel Porret, Binningen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland
No Drawing. Filed Nov. 9, 1971, Ser. No. 197,121
Claims priority, application Switzerland, Nov. 17, 1970, 16,963/70
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 **5 Claims**

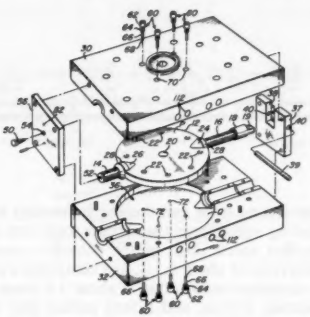
3-glycidyl-hydantoin isocyanates are disclosed which can be prepared by reacting a di- or tri-isocyanate, such as 3,5,5-trimethyl-3 - isocyanatomethyl - cyclohexaneisocyanate (isophoronediisocyanate) or the triisocyanate obtained from 3 moles of hexamethylene-diisocyanate and having biuret structure, with a 3-glycidyl-hydantoin, e.g. 3-glycidyl - 5,5 - dimethyl - hydantoin. Said 3 - glycidyl-hydantoin isocyanates are suitable, for example, as intermediates for the production of epoxide resins. They can also be cured with polyfunctional cross-linking agents, particularly polyamines and aminoalcohols, to give molded shapes distinguished by good mechanical properties.

3,814,776
HYDANTOINS AND POLYHYDANTOINS CONTAINING OLEFIN GROUPS
Rolf Fischer, Cologne, and Rudolf Merten, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Continuation of abandoned application Ser. No. 9,075, Feb. 5, 1970. This application Mar. 7, 1972, Ser. No. 232,636
Claims priority, application Germany, Feb. 21, 1969, P 19 08 678.3
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 **6 Claims**

Oligohydantoins and polyhydantoins which contain olefinically unsaturated groups are produced by reacting polyglycine esters and isocyanates which contain an olefinically unsaturated group, optionally together with di- or polyisocyanates.

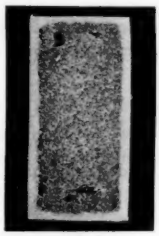
3,814,777
METHOD OF MAKING A COATED BUTTERFLY VALVING MEMBER
Peter James Schmidt, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio
Filed June 15, 1972, Ser. No. 262,978
Int. Cl. B29b *3/00*; B29f *1/10*
U.S. Cl. 264—40 **1 Claim**

All surfaces of a butterfly type valving member which may be exposed to attack by corrosive substances, are coated with a protective material of the class of tetrafluoroethylene or equivalent substance, by a high-pressure and high-temperature molding process; the process involves initially providing lateral support for the opposite faces of the valve disc for maintaining a predetermined



spacing between the axial faces of the disc and mold during the introduction of heat fluidified coating material into the mold, and of then withdrawing such lateral support first from one side and then from the other side of the disc during a critical phase of the molding procedure to ensure uniform coating of said disc.

3,814,778
METHOD FOR PRODUCING A COMPOSITE FOAMED ARTICLE
Kirokuro Hosoda, Yokohama, Naonori Shiina and Yoshio Kadowaki, Tokyo, Makoto Hashimoto, Yokohama, Naohiko Suzuki, Funabashi, and Tadashi Sugita, Sakai, Japan, assignors to The Furukawa Electric Company Limited, Tokyo, and Nissei Kogyo Kabushiki Kaisha, Osaka-fu, Japan
Filed Aug. 26, 1971, Ser. No. 175,206
Int. Cl. B29c *5/04*; B29d *27/00*; B65d *19/32*
U.S. Cl. 264—45 **13 Claims**

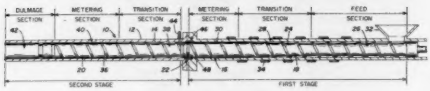


A method for producing foamed composite article which comprises placing powdered plastics and granular plastics containing foaming agent in a mold, rotating or vibrating the mold to separate said two kinds of plastics from each other, and heating and foaming the same while rotation, or vibration of the mold is continued.

3,814,779
METHOD OF FORMING FOAMED POLYSTYRENE ARTICLES FROM POLYSTYRENE BEADS
Donald F. Wiley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.
Filed Apr. 1, 1971, Ser. No. 130,258
Int. Cl. B29d *27/00*; B29f *3/06*
U.S. Cl. 264—53 **1 Claim**

A screw extruder for converting polystyrene beads into foam including an extruder screw having a first screw

stage for receiving polystyrene beads and for compressing and melting the beads to form melted polystyrene and a second screw stage for receiving melted polystyrene from the first stage and for distributing a blowing agent throughout the melted polystyrene; and a ring valve for controlling the flow of melted polystyrene from the first



stage to the second stage and thereby preventing backflow of the blowing agent from the second stage into the first stage. The first screw stage of the extruder screw has a compression ratio of about 3.5:1, and comprises a metering section, a transition section that is about 1.5 times as long as the metering section, and a feed section that is about 2 times as long as the metering section.

3,814,780

PROCESS FOR MOLDING FOAMED POLYURETHANE ARTICLES INVOLVING THE USE OF MULTIPLE POURING DEVICES

Edwin S. Woodhall, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Original application June 16, 1969, Ser. No. 833,424, now Patent No. 3,621,522. Divided and this application July 29, 1971, Ser. No. 167,197

Int. Cl. B29d *27/04*; G01f *1/04*

U.S. Cl. 264—54 **3 Claims**

This invention relates to an apparatus for pouring polyurethane foamable molded goods wherein at least one pouring head has moved over the molds of one row of one set of molds and then moved over to the second row to permit the second row of molds to be poured in the desired sequence.

3,814,781

METHOD OF MAKING FOOTWEAR HAVING A POLYURETHANE SOLE

Shoji Oka and Takashi Wakabayashi, Osaka, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation of application Ser. No. 767,899, Sept. 16, 1968, which is a continuation-in-part of application Ser. No. 594,581, Nov. 15, 1966, both now abandoned. This application Apr. 19, 1972, Ser. No. 245,620

Int. Cl. B29h *7/08*

U.S. Cl. 264—54 **9 Claims**

Method for producing footwear having a polyurethane sole of desired specific gravity which comprises casting a liquid, polyurethane-forming material into a shoe sole mould maintained at a definite initial temperature, mounting a last which bears a shoe upper on the shoe sole mould, allowing the polyurethane-forming material to foam and adhere to the bottom of the upper, and then removing the mould and last from the product and curing the foamed shoe sole.

3,814,782

MAKING ALUMINA FIBERS FROM A MIXTURE OF ALUMINA SOL AND HEXAMETHYLENETETRAMINE

John C. Hayes, Palatine, and Jay E. Sobel, Des Plaines, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 787,605, Dec. 27, 1968, now Patent No. 3,632,704. This application Apr. 21, 1971, Ser. No. 131,542

The portion of the term of the patent subsequent to Jan. 4, 1989, has been disclaimed

Int. Cl. C04b *31/04, 35/10*

U.S. Cl. 264—63 **4 Claims**

A method of preparing flexible, refractory inorganic fibers. A refractory inorganic oxide sol, e.g., an alumina sol, is admixed with a soluble organic amine, suitably hexamethylenetetramine, and drawn into fibers. The fibers are thereafter calcined at 300–1000° C. to produce porous flexible fibers of high surface area. The hexamethylenetetramine has the effect of inhibiting crystal growth of the gamma-alumina during the fiber calcining step.

3,814,783

METHOD FOR MANUFACTURING STERILE CONTAINERS

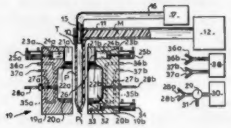
Edgar Dardaine, Sorel-Moussel, and Jean-Luc Berry, Mesnil-sur-l'Estree, France, assignors to E. P. Remy, et Cie, Dreux, France

Filed Feb. 2, 1972, Ser. No. 222,896

Claims priority, application France, Feb. 12, 1971, 7104787

Int. Cl. B29c *17/07*

U.S. Cl. 264—89 **7 Claims**



Method of manufacturing sealingly closed plastic containers. An extruded parison is maintained with its interior in communication with a source of sterile gas under a constant pressure slightly higher than atmospheric. A vacuum is created in the region of a mold surrounding the parison while the parison remains in permanent communication with the source of sterile gas under pressure, the vacuum shaping the parison against the mold. The top of the formed container is sealed and the container is discharged from the mold.

3,814,784

FORMING DEEP ARTICLES HAVING RELATIVELY BALANCED MOLECULAR ORIENTATION

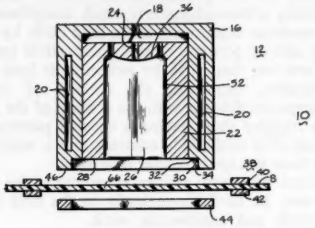
William D. Wolf, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

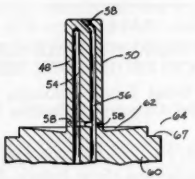
Continuation-in-part of abandoned application Ser. No. 113,577, Feb. 8, 1971. This application June 5, 1972, Ser. No. 259,793

The portion of the term of the patent subsequent to June 5, 1990, has been disclaimed

Int. Cl. B29c *17/04*

U.S. Cl. 264—89 9 Claims





A method of forming articles having relatively balanced molecular orientation from substantially amorphous thermoplastic sheet material. The sheet material is forced by means of a plug in an axial direction while at a temperature within a range at which rubbery flow of the thermoplastic occurs to partially form the article while developing a limited amount of orientation in the axial direction. The thus forced material is held in contact with a temperature conditioned surface to reduce its temperature to one which is above the glass transition temperature of the material and is within a range whereat the ratio of modulus to temperature is greater than 1 in a plot of modulus of the material versus temperature. Then the material is expanded outwardly against the walls of a mold cavity while within said latter temperature range to develop radial orientation and finish form the article.

3,814,785

HEAT STABILIZATION OF ORIENTED THERMOPLASTIC FILMS

Grahame Melvin Reade, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

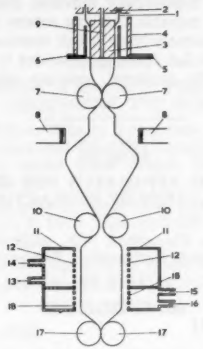
Continuation of abandoned application Ser. No. 889,171, Dec. 30, 1969. This application Sept. 1, 1972, Ser. No. 285,621

Claims priority, application Great Britain, Jan. 3, 1969, 479/69

Int. Cl. B29c *25/00;* B29d *23/04*

U.S. Cl. 264—89 12 Claims

Heat setting tubular thermoplastic film by passing the inflated tube through a perforated sleeve and providing heated air under pressure between the sleeve and the



exterior of the tube to balance the pressure inside the tube and venting said air to atmosphere.

3,814,786

PROCESS FOR MAKING POLYBUTYLENE TEREPHTHALATE BLOW MOLDED ARTICLE

John S. Gall, North Haledon, and George W. Halek, Summit, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed June 12, 1972, Ser. No. 261,847

Int. Cl. B29c *17/07*

U.S. Cl. 264—98 5 Claims

A polybutylene terephthalate melt at a temperature in the range of the melt temperature of polybutylene terephthalate and 495° F., and having an intrinsic viscosity of at least 1.05 deciliters per gram is blow molded in an extrusion blow molding apparatus the mold of which is maintained at a temperature of less than 150° F. to produce polybutylene terephthalate blown articles possessing excellent strength characteristics. Bottles, especially aerosol pressurized bottles, are a primary application of the type of articles produced by this process.

3,814,787

METHOD AND APPARATUS FOR CONVEYING SLABS OF PARTICULATE, FIBROUS MATERIAL FROM A COMMON SLAB FORMING APPARATUS TO HOT PRESSES ASSOCIATED THEREWITH

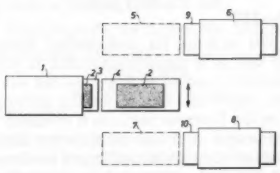
Bengt J. Carlsson, Motala, Sweden, assignor to AB Motala Verkstad, Motala, Sweden

Filed May 26, 1972, Ser. No. 257,227

Claims priority, application Sweden, June 8, 1971, 7,419/71

Int. Cl. B29j *5/00*

U.S. Cl. 264—109 6 Claims



Particle slabs produced by a single particle slab forming apparatus are charged into at least two single layer

presses, each of which provides a single opening for pressing slabs. The slabs produced are introduced alternately into respective ones of two, three, four and five single layer presses by transversely movable charging means. The transversely movable charging means is mounted to move slabs transversely from a belt conveyor at the discharge end of the slab forming apparatus to positions opposite transversely arranged separate single-stage hot presses.

3,814,788

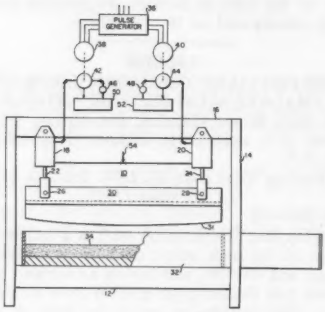
METHOD AND APPARATUS FOR THE ROCKING COMPACTION OF REFRACTORY METAL POWDERS

Phillip A. Livera, Bloomfield, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1971, Ser. No. 201,882

Int. Cl. B22f 3/02

U.S. Cl. 264—111 10 Claims



A method and apparatus for compacting refractory metal powders into ingot form by means of an hydraulically operated curved blade which is progressively rocked across a mold containing loose refractory metal powder to compact that powder into usable ingot form.

3,814,789

PROCESS FOR COMPACTING FLUORSPAR FOR METALLURGICAL USE

Robert James Cox, Brownsville, Tex., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Feb. 25, 1972, Ser. No. 229,451

Int. Cl. B01j 2/10

U.S. Cl. 269—117 3 Claims

An improved process for compacting finely divided fluorspar for use as a metallurgical flux is provided in which tall oil pitch is added to finely divided wet fluorspar which is then mixed and heated until a uniform coating of the pitch on the fluorspar particles is obtained. The fluospar particles coated with tall oil pitch are then dried to a low moisture content while cooling to produce agglomerates which are then compacted in a suitable manner such as by briquetting. The process provides improved continuity in compacting operations to produce compacted fluorspar with improved physical qualities while permitting the use of tall-oil pitch, an inexpensive binder.

3,814,790

METHOD OF MAKING MOLDED COMPOSITE ARTICLES HAVING A COLORED PATTERN SURFACE

Chuzo Kato and Masashi Kawazoe, Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

No Drawing. Filed June 30, 1972, Ser. No. 268,114

Claims priority, application Japan, July 8, 1971, 46/49,892

Int. Cl. B41m 1/26; B44c 1/24

U.S. Cl. 264—122 10 Claims

A process for the production of molded composite articles having a colored pattern which comprises molding a composition comprising more than 30% by weight of at least one of powders of non-combustible inorganic materials and less than 70% by weight of at least one of organic binders, contacting the surface of resultant molded composite product with the surface of the pattern layer of a transfer sheet having a colored pattern which is comprised of a sublimable colorant and a vehicle, and subjecting them to a heat-transfer treatment.

The molded composite articles according to the present invention may be used conveniently in the field of construction work and engineering work.

3,814,791

METHOD OF PREPARING PILE SURFACED PRODUCTS FROM EPOXY RESIN

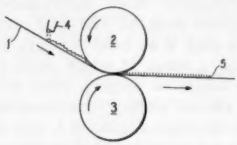
Michael Edward Benet Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 21, 1972, Ser. No. 246,251

Claims priority, application Great Britain, June 16, 1971, 28,206/71

Int. Cl. B29c 17/02; B32b 5/00

U.S. Cl. 264—164 8 Claims



A method of preparing pile surfaced products which comprises contacting with a surface to which it adheres a curable epoxy resin of which the uncured state has between 2.0 and 0.2 gram equivalents of epoxide groups per kilogram of resin, separating the resin from the surface at a point at which it is capable of fibrillation, so that fibres are formed in the resin, effecting cure of the fibres to stabilize them, and detaching the resin and its adherent fibres from the said surface.

3,814,792

PROCESS FOR SHAPING ALIPHATIC POLYAMIDE COMPOSITION

Tamio Arakawa and Yozi Kuroda, Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 22, 1971, Ser. No. 126,593

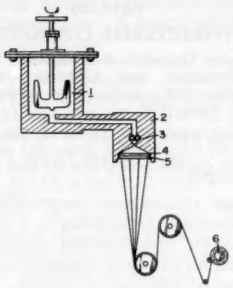
Claims priority, application Japan, Mar. 23, 1970, 45/24,721, 45/24,722

Int. Cl. B28b 3/20

U.S. Cl. 264—176 R 7 Claims

A process for shaping a polymer composition by dissolving an aliphatic polyamide or a blend of an aliphatic

polyamide and a hydrophilic polymer in a mixed solvent of an aliphatic alcohol having 1 to 4 carbon atoms and water (the alcohol being 15 to 80% by weight) at an elevated pressure at a temperature of at least 130° C.



to form a polymer solution having a polymer concentration of 25 to 80% by weight, and extruding the solution into the atmosphere at an extrusion temperature of 115 to 155° C.

3,814,793

PROCESS FOR DRYING CRIMPED POLYBENZIMIDAZOLE CONTINUOUS FILAMENTARY MATERIALS EMPLOYING MICROWAVE DRYING

Arthur E. Prince, Jr., and Kenneth S. Burns, Basking Ridge, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Mar. 31, 1972, Ser. No. 239,972

Int. Cl. D01f 3/10

U.S. Cl. 264—210 F **7 Claims**

Polybenzimidazole continuous filamentary materials (e.g., monofilament and multifilament such as strand, cable, yarn, tow, etc.) which have been wet-crimped (e.g., steam-crimped) contain substantial quantities of residual moisture. The wet, crimped polybenzimidazole continuous filamentary material is subjected to an electric field having a frequency in the microwave range (i.e., above 890 megahertz) to remove the residual moisture in excess of the natural moisture regain level without disturbing the crimp of the material.

3,814,794

THERMAL PROCESS FOR REMOVING SOLVENT FROM POLYBENZIMIDAZOLE CONTINUOUS FILAMENTARY MATERIALS

Arthur E. Prince, Jr., Basking Ridge, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed Mar. 31, 1972, Ser. No. 240,228

Int. Cl. D01d 5/12

U.S. Cl. 264—210 F **7 Claims**

An improvement in the process for the removal of solvent from solvent-containing fibrous materials such as dry-spun polybenzimidazole continuous filamentary material is disclosed. The as-spun continuous filamentary material is heated to substantially remove the solvent contained therein without substantial oxidative degradation of the material.

ERRATA

For Classes 423—210 and 423—644 see: Patents Nos. 3,814,799 and 3,814,813

3,814,795

ANTIBIOTIC S 15–1 AND PROCESS FOR PRODUCING THE SAME

Kei Arima, Tokyo, Takeshi Kawamura, Saitama, Gakuzo Tamura, Tokyo, and Teruhiko Beppu, Matsudo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of abandoned application Ser. No. 177,382, Sept. 2, 1971. This application Nov. 15, 1972, Ser. No. 306,878

Claims priority, application Japan, Sept. 7, 1970, 45/77,803

Int. Cl. A61k 21/00

U.S. Cl. 424—116 **3 Claims**

New antibiotic S 15–1, $C_{18}H_{38}N_6O_{10}$, which has wide antimicrobial power against gram-positive, gram-negative, acid fast bacteria and, particularly, Newcastle disease virus and further, when in high concentration, against molds and yeasts is produced by culturing aerobically *St. griseocarneus* S 15–1 NRRL 5311 in a culture medium containing carbon and nitrogen sources and other nutritive materials until antibiotic S 15–1 is accumulated and then recovering the antibiotic from the medium.

3,814,796

ANTIBIOTICS ZORBONOMYCIN AND ZORBONOMYCIN B AND PROCESS FOR THE PREPARATION THEREOF

Alexander D. Argoudelis, Portage, Malcolm E. Bergy, Kalamazoo, and Thomas R. Pyke, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 9, 1969, Ser. No. 865,096

Int. Cl. A61k 21/00

U.S. Cl. 424—117 **11 Claims**

Antibiotics zorbonomycin and zorbonomycin B producible by culturing *Streptomyces bikiniensis* var. *zorbonensis* var. nova. in an aqueous nutrient medium. These antibiotics inhibit the growth of *Staphylococcus aureus* and other microorganisms, and can be used to inhibit such microorganisms in various environments.

3,814,797

AQUEOUS LUBRICATING COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Fumio Kasahara, Chiba-ken, and Kazuo Takeshita, Fujisawa, Japan, assignors to Kimitsu Chemical Laboratory Co., Ltd., and Showa Yakuhinkako Kabushiki Kaisha, both of Tokyo, Japan

Filed June 15, 1972, Ser. No. 263,321

Claims priority, application Japan, June 24, 1971, 46/45,874

Int. Cl. A61k 27/00

U.S. Cl. 424—128 **5 Claims**

The present invention relates to aqueous lubricating compositions for imparting lubricity to the parts of living bodies comprising:

(A) potassium polymetaphosphate,

(B) a member of the group consisting of alginic acid, carboxymethyl cellulose, carboxymethyl starch and salts and mixtures thereof, and

(C) a member of the group consisting of sodium salts of weak acids and mixtures thereof,

and a process for the preparation thereof.

3,814,798

CONTROL OF INSECTS AND NEMATODES WITH VINYL PHOSPHATE DERIVATIVES

Henry Martin and Josef Drabek, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

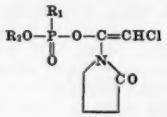
No Drawing. Original application May 18, 1970, Ser. No. 38,570, now Patent No. 3,705,904, dated Dec. 12, 1972. Divided and this application Dec. 7, 1972, Ser. No. 314,201

Claims priority, application Switzerland, May 19, 1969, 7,679/69; July 22, 1969, 11,193/69

Int. Cl. A01n *9/22, 9/24, 9/36*

U.S. Cl. 424—200 6 Claims

Vinyl phosphate derivatives, including particularly compounds of the formula



in which (a) R_1 is methoxy and R_2 is methyl or (b) R_1 is ethoxy and R_2 is ethyl, are useful as pesticidal agents, particularly in the control of insects and nematodes.

3,814,799

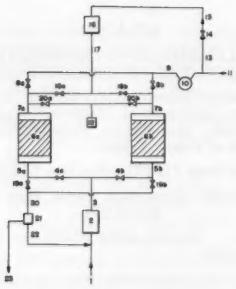
PURIFYING GASES CONTAINING MERCURY OR MERCURY AND OXYGEN AS IMPURITIES

Ewald Wygasch, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft

Filed Jan. 14, 1972, Ser. No. 217,850

Int. Cl. B01d *53/34*

U.S. Cl. 423—210 7 Claims



Impurities consisting of mercury and/or oxygen are removed from gases by means of an absorbent supported on a carrier.

The absorbent used is copper, and the carrier is aluminum oxide. The aluminum oxide has an internal surface area of from 100 to 300 $m.^2/g.$, a pore volume of from 0.5 to 0.8 $cm.^3/g.$ and an average pore diameter of from 40 to 80 A.

3,814,800

ANTIBACTERIAL COMPOSITION

Edmund Stanley Granatek, Baldwinsville, Murray Arthur Kaplan, Syracuse, and Alphonse Peter Granatek, Baldwinsville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Feb. 16, 1970, Ser. No. 11,782

Int. Cl. A61k *21/00*

U.S. Cl. 424—271 11 Claims

Antibacterial compositions comprising a water soluble salt of ampicillin or hetacillin or a mixture thereof, water and acetone have improved stability and are particularly useful for parenteral administration for the treatment of bacterial infections in animals.

3,814,801

DERIVATIVES OF N-ALKINYLTRIHALOGENIMIDAZOLE FOR COMBATING ECTOPARASITES

Henry Martin, Basel, Switzerland, and Georg Pissiotas, Loerrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Original application Oct. 7, 1969, Ser. No. 864,542, now Patent No. 3,661,924, dated May 9, 1972. Divided and this application Feb. 2, 1972, Ser. No. 223,017

Claims priority, application Switzerland, Oct. 17, 1968, 15,559/68

Int. Cl. A61k *27/00;* A01n *9/22*

U.S. Cl. 424—273 8 Claims

N-alkynyl-2,4,5-trihalogenimidazoles are useful in combating ectoparasites.

3,814,802

N-SUBSTITUTED IMIDAZOLES, AS ANTIMYCOTIC AGENTS

Wilfried Draber, Helmut Timmler, Karl Heinz Buchel, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer AG, Leverkusen, Germany

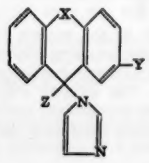
No Drawing. Original application Oct. 21, 1971, Ser. No. 191,495. Divided and this application Apr. 6, 1973, Ser. No. 348,585

Claims priority, application Germany, Oct. 29, 1970, P 20 53 080.7

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 40 Claims

Antimycotic agents of the formula:



wherein

X is a carbon-carbon bond, oxygen, sulfur, ethylene or vinylene;
Y is hydrogen or halogen; and
Z is lower alkyl, lower alkenyl, lower alkynyl or cycloalkyl of 3 to 6 carbon atoms,

are prepared from thionyl-bis-imidazole and the appropriate fused dibenzocarbinol. A typical embodiment is 9-methyl-9-imidazolylfluorene.

3,814,803
STABILIZED PESTICIDAL COMPOSITIONS CONTAINING ALKYL DINITROPHENYL ESTERS
John H. Eckfeldt, Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed July 12, 1971, Ser. No. 161,451
Int. Cl. A01n *9/12, 9/20*
U.S. Cl. 424—286 **7 Claims**

The hydrolysis of pesticidal alkyl dinitrophenyl esters, upon aging in formulated products, leading to the phytotoxic alkyl dinitrophenols, is controlled by incorporation into the pesticidal formulation of a stabilizer selected from one or more of maleic acid, maleic anhydride, itaconic anhydride, phthalic anhydride and crotonyl chloride, and citraconic anhydride.

3,814,804
USE OF COBALT DODECENEDIOATE FOR TREATING SKIN CONDITIONS
August J. Pacini, San Pedro, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.
No Drawing. Application Jan. 22, 1970, Ser. No. 10,680, now Patent No. 3,720,773, dated Mar. 13, 1973, which is a division of application Ser. No. 715,167, Nov. 24, 1970, now Patent No. 3,542,826. Divided and this application Jan. 17, 1972, Ser. No. 218,621
Int. Cl. A61k *27/00*
U.S. Cl. 424—295 **1 Claim**

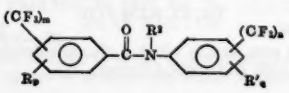
The cobalt salt of trans-dodecenedioic acid has been found to be a highly effective agent against unindurated acne, neurodermatitis, seborrheic dermatitis, psoriasis, burns, ulcerations and pruritis.

3,814,805
CYCLOPROPANE CARBOXYLIC ACID ESTERS AS INSECTICIDES
John Mervyn Osbond, Hatfield, and James Charles Wickens, St. Albans, England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Original application Apr. 27, 1971, Ser. No. 139,296, now Patent No. 3,761,506. Divided and this application Sept. 12, 1972, Ser. No. 288,463
Int. Cl. A01n *9/24*
U.S. Cl. 424—306 **6 Claims**

Cyclopropane carboxylic acid esters of phenoxybutynyl alcohols. The phenyl ring may include a chloro or lower alkyl substituent. The esters are useful as insecticides.

3,814,806
INSECTICIDAL COMPOSITIONS AND METHODS EMPLOYING TRIFLUOROMETHYL SUBSTITUTED BENZANILIDES
Paul J. Stoffel, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Application Dec. 23, 1971, Ser. No. 211,715, now Patent No. 3,746,762, which is a continuation-in-part of abandoned application Ser. No. 57,789, July 23, 1970. Divided and this application Dec. 18, 1972, Ser. No. 316,162
Int. Cl. A01n *9/20*
U.S. Cl. 424—324 **14 Claims**

Compounds of the formula



wherein *m* and *n* are integers from 1 to 2, inclusive, *p* and *q* are integers from 0 to 2, inclusive, R and R′ are halo or nitro, and R^3 is hydrogen or formyl. These compounds are useful as insecticides.

3,814,807
NEMATODE CONTROL EMPLOYING CERTAIN HALO-α-ALKYL-BENZYL ALCOHOLS
Hsing Y. Fan, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.
No Drawing. Filed Dec. 30, 1970, Ser. No. 102,994
Int. Cl. A01n *9/24, 9/20*
U.S. Cl. 424—343 **4 Claims**

Halo-α-alkyl-benzyl alcohols and their derivatives are used for the control of soil-borne nematodes.

3,814,808
COMPOSITION AND METHOD FOR GENERATING STABILIZED LACRIMATING FOAM FOR TUNNEL DENIAL
James L. Schwendeman and Ival O. Salyer, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Army
Filed Oct. 3, 1968, Ser. No. 766,036
Int. Cl. A01n *7/00, 17/06*
U.S. Cl. 424—360 **14 Claims**

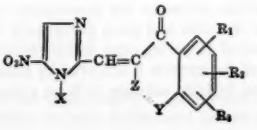
A chemical composition comprising gelatin, preservative material, crosslinking material, and lacrimating agent to produce a foam by utilizing a system having means to blow the composition into a nozzle and spray the composition against a screen; the foam being used for the denial of access to and use of underground tunnels.

3,814,809
SUSTAINED RELEASE CONTRACEPTIVE COMPOSITION AND METHOD OF USE
Maxwell Gordon, De Witt, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
No Drawing. Filed Nov. 11, 1971, Ser. No. 197,959
Int. Cl. A61j *3/00, 3/08;* **A61k** *27/00*
U.S. Cl. 424—19 **15 Claims**

Compositions comprising prostaglandin $F_{2\alpha}$ or E_2, oxytocin, and copper or zinc salts of ethylene diamine tetraacetic acid with a portion of the prostaglandin being dissolved in a biodegradable wax; in the form of vaginal suppositories and/or impregnated tampons and methods of preventing conception or implantation by vaginal insertion of said compositions after exposure to conception are useful contraceptive aids in mammals.

3,814,810
5-NITRO-IMIDAZOLES AS ANTIMICROBIAL AGENTS
Clemens Rufer, Rudolf Albrecht, Hans-Joachim Kessler, and Eberhard Schroder, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany
No Drawing. Continuation-in-part of application Ser. No. 53,298, July 8, 1970, now Patent No. 3,721,668. This application Jan. 18, 1973, Ser. No. 324,598
Claims priority, application Germany, July 10, 1969, P 19 35 685.5
Int. Cl. A61k *27/00*
U.S. Cl. 424—248 **10 Claims**

Pharmaceutical compositions comprising 5-nitro-imidazoles of the formula



wherein X is hydrocarbon or a free or esterified hydroxy group; Y and Z each are H or, collectively, a bridging group consisting of $—CH_2—$ and/or one of O, S, SO and SO_2, $—CH_2CH_2—$, or —CHA— wherein A is $—CH_3$, $—C_2H_5$ or $—C_6H_5$; R_1 and R_2 each are alkyl, halogen or free, esterified or etherified —OH; and R_3 is H, alkyl, substituted alkyl, halogen, free, esterified or etherified—OH, amino, amido or aminoalkoxy; in admixture with a pharmaceutically acceptable carrier, and their use for the treatment of trichomoniasis.

3,814,811

METHOD OF ELIMINATING OR ALLEVIATING LOCAL PAIN WITH DIETHYLAMINOETHYL FLUFENAMATE

Francisco Javier Andreu Batllo and Juan Antonio Andreu Bufill, Barcelona, Spain, assignors to Doctor Andreu, S.A., Barcelona, Spain

Filed June 7, 1972, Ser. No. 260,485

Int. Cl. A61k *27/00*

U.S. Cl. 424—309 **4 Claims**

The present invention relates to a novel method for treating a mammalian body afflicted with local pain. This method is effected by applying topically to the affected site diethylaminoethyl flufenamate or one of its salts.

3,814,812

MEDICAMENT AND METHOD OF INCREASING THE CALCIUM CONTENT OF THE BLOOD

Pierre Luc Georges Eymard, Fontaine, France, assignor to Laboratories J. Berthier S.A., Grenoble, France

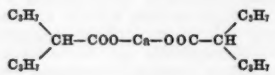
No Drawing. Filed Feb. 23, 1971, Ser. No. 117,950

Claims priority, application France, Feb. 24, 1970, 7006583

Int. Cl. A61k *27/00*

U.S. Cl. 424—318 **1 Claim**

A derivative of dipropylacetic acid having the formula:



which when mixed with a pharmaceutically acceptable carrier medium is administered to humans and animals to increase the calcium content of the blood, is prepared by stirring and heating to less than 100° C. a mixture of water and calcium oxide, adding dipropylacetic acid, keeping the mixture for several hours below 100° C., filtering, concentrating the filtrate, treating the filtrate with acetone, removing the acetone and drying the residue.

3,814,813

PREPARATION OF SODIUM ALUMINUM HYDRIDE

George S. Fujioka, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 12, 1960, Ser. No. 75,440

Int. Cl. C01b *6/28*

U.S. Cl. 423—644 **2 Claims**

This invention relates to the preparation and purification of metal hydrides and more particularly is concerned with a method of preparing ether soluble hydrides wherein purification of the hydride is achieved by massive dilution of an ethereal hydride solution with an aromatic organic solvent.

3,814,814

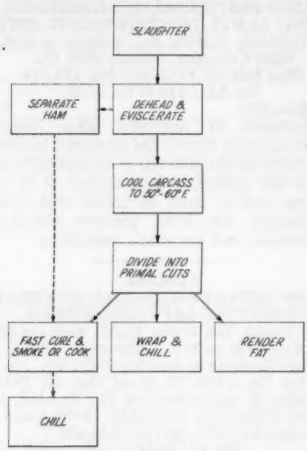
PROCESSING HOGS

Charles H. Wallace, Carrollton, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation-in-part of abandoned application Ser. No. 101,900, Dec. 28, 1970. This application Jan. 11, 1972, Ser. No. 217,025

Int. Cl. A22c *18/00*

U.S. Cl. 426—2 **5 Claims**



A method of processing animals, specifically hogs, is provided. According to the method, after the hogs are slaughtered, de-headed, and eviscerated, they are quickly cooled to a temperature of only about 50°–60° F. and are then immediately divided into market cuts. The appropriate cuts to be heated are then internally heated by pumping hot brine into or through them and they are then further heated in continuous ovens or tunnels and brought to smoking or cooking temperature. They are then chilled, after they have been cooked at the desired temperature, by their temperature being lowered by pumping cold brine through them. Fresh cuts are wrapped and then chilled. The fat is also rendered immediately into lard. If desired, before the carcasses are cooled to about 50°–60° F., they can be inverted and the hams chopped off, leaving substantially less weight to be cooled and subsequently heated. The overall process is both rapid and continuous so that hogs brought in the morning are processed into products which are ready for the market the same evening.

3,814,815

METHOD OF MANUFACTURING GUM BASES

Juzo Hashimoto, Hirakata, Hisashi Kawamoto, Takatsuki, Isao Kanbara, Moriguchi, Akira Inoue, Ikeda, and Akira Kitajima, Takatsuki, Japan, assignors to The Ezaki Glico Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed May 8, 1972, Ser. No. 251,426

Claims priority, application Japan, Oct. 22, 1971, 46/84,110, 46/84,111

Int. Cl. A23g *3/30*

U.S. Cl. 426—3 **11 Claims**

Chewing gum base in which a gluten is denaturated by more than 10% and method thereof.

3,814,816
VEGETABLE AERATING PROTEINS
Robert C. Gunther, Galesburg, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Continuation of abandoned application Ser. No. 700,383, Jan. 25, 1968. This application Feb. 8, 1971, Ser. No. 113,756
Int. Cl. A23j *3/02*; A23l *1/20*
U.S. Cl. 426—46 16 Claims

Oil-free vegetable protein, preferably soya, is hydrolyzed in the presence of acid or alkali to give hydrolyzed protein having a predetermined degradation as determined by viscosity measurements of aqueous solutions, the hydrolyzed protein then further modified with pepsin to yield pepsin modified hydrolyzed protein which, in the presence of water and sugar, whips at a rapid rate of produce aerated products of low density.

3,814,817
PROCESS FOR CURING DRY AND SEMI-DRY SAUSAGES
Charles W. Everson, Warren, Wilson E. Danner, Linden, and Paul A. Hammes, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of applications Ser. No. 52,718, July 6, 1970, Ser. No. 207,574, Dec. 13, 1971, and Ser. No. 257,870, May 30, 1972, all now abandoned. This application Aug. 6, 1973, Ser. No. 385,788
Int. Cl. A22c *11/00*
U.S. Cl. 426—56 6 Claims

An improved process for preparing dry and semi-dry sausages using *Lactobacillus plantarum* NRRL–B–5461 either alone or with other lactic acid producing microorganisms. The process can be effected in the presence or absence of glutamic acid in the meat mixture.

3,814,818
POTATO AND POTATO CHIP FLAVOR AND AROMA
Stephen S. Chang, East Brunswick, and Boyapalle R. Reddy, Piscataway, N.J., assignors to Research Corporation, New York, N.Y.
No Drawing. Original application Aug. 9, 1968, Ser. No. 751,335, now Patent No. 3,619,211. Divided and this application Sept. 7, 1971, Ser. No. 178,419
Int. Cl. A23l *1/26*
U.S. Cl. 426—65 4 Claims

A flavor and aroma reminiscent of potato and potato chip is prepared by heating methionine or a mixture of methionine and a reducing sugar, such as glucose, in the presence of an oil, such as a cooking oil, e.g. corn oil, such as heating under deep fat frying conditions. The resulting oil can be used as a salad oil or as an ingredient of a salad dressing or soups, such as potato soup or tomato soup, or can be used as a frying oil or applied to food products since the resulting oil has a potato and potato chip flavor and aroma. A potato and potato chip flavor and aroma can also be imparted to foods, including food of animal or vegetable origin, including sea food, such as snack foods prepared from starch or flour, by applying or incorporating methionine in such foods followed by heating, such as deep fat frying. Additionally, a potato chip of improved taste can be obtained by adding methionine to potato slices and then frying in oil or by employing in the manufacture of potato chips a cooking or deep fat frying oil containing methionine or an admixture of methionine and a reducing sugar, such as glucose.

3,814,819
HIGH PROTEIN FOOD BAR
Jay E. Morgan, Edina, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.
Filed Mar. 10, 1971, Ser. No. 122,912
Int. Cl. A23l *1/30*
U.S. Cl. 426—72 14 Claims

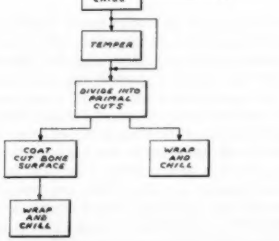
A protein fortified food bar of a controlled calorie content is composed of several crisp wafers stacked one above the other with a creamy filling between them. Each wafer is composed of 10 parts of flour, about 6 parts of added protein, e.g. calcium caseinate or a lactalbumin-casein coprecipitate, about 0.8 parts oil as a release agent and a small amount of chemical leavening. The filling layered between the wafers consists of 10 parts shortening, about 10 parts of a finely divided protein such as milk protein, about 6 parts sugar, a minor amount of flavor if desired and a vitamin and mineral mixture, if desired. A confectioners coating can be applied over the composite bar if desired.

3,814,820
FRUIT AND VEGETABLE CONTACT WITH CHLORINE CONTAINING BIOCIDES AND DISCOLORATION INHIBITORS
Francis F. Busta, St. Paul, and Irving M. Brooks, Golden Valley, Minn., assignors to Salad Supreme Incorporated, Minneapolis, Minn.
No Drawing. Filed Dec. 2, 1969, Ser. No. 881,578
Int. Cl. A23l *3/00*
U.S. Cl. 426—262 12 Claims

The process of treating lettuce and other salad ingredients to extend or prolong their quality and reduce microbiological contamination. Dismembered lettuce (i.e. sliced, chopped or otherwise fractured) is treated under controlled conditions as follows:

(1) Washed in a cleansing solution;
(2) Rinsed in potable water;
(3) Contacted with an aqueous sanitizing agent (e.g. sodium hypochlorite);
(4) Optionally rinsed again in potable water;
(5) Contacted with a discoloration inhibitor in the optional presence of a chelating agent; and
(6) Extracted of excess discoloration inhibitor.

3,814,821
METHODS FOR PROTECTING THE COLOR OF CUT BONE SURFACES IN FRESH AND FROZEN MEAT
Robert J. Oliver, Smithfield, Va., and Earl W. Turner, Port Chester, N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Feb. 23, 1972, Ser. No. 228,681
Int. Cl. A22c *18/00*; A23b *1/00*
U.S. Cl. 426—265 3 Claims



A method for protecting the natural red color of the cut bone surface of both chilled and frozen meat to pre-

vent "bone darkening" due to discoloration of the marrow on the cut bone surfaces. The present invention describes methods for coating the cut bone surfaces of various cuts of meat products to prevent oxidation of the natural heme pigments in the bone marrow followed by protective packaging for distribution.

3,814,822

PROCESS FOR PREPARING A COATED READY-TO-EAT BREAKFAST CEREAL

Larry J. Henthorn, Crystal Lake, and Frank R. Kincs, Barrington, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed Feb. 22, 1972, Ser. No. 228,311

Int. Cl. A23l *1/10, 1/18*

U.S. Cl. 426—293 **4 Claims**

A process for the preparation of a pre-sweetened, moisture resistant ready-to-eat breakfast cereal is disclosed which includes applying a hard butter containing crystalline sugar to the breakfast cereal.

3,814,823

MEAT ANALOGS HAVING THE FIBER STRUCTURE OF MEAT

Jih Hsin Yang, Cincinnati, and Robert A. Olsen, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Sept. 30, 1970, Ser. No. 77,032

Int. Cl. A23j *3/00*

U.S. Cl. 426—362 **16 Claims**

A process of forming a meat-like protein-containing product having unidirectional parallel fiber structure similar to that of natural meat fiber structure. The process involves forming a protein mix containing a heat-coagulable protein, adjusting the moisture content of the protein mix to form a wet mix having a moisture content within the range of 20% to 80% by weight, mixing the wet mix to provide a coherent workable protein-containing dough, and thereafter subjecting the coherent workable protein dough to non-turbulent stretching and heat to provide unidirectional parallel meat-like fibers.

3,814,824

BREAKFAST CEREALS CONTAINING SOY MATERIAL AND SODIUM BICARBONATE

William T. Bedenk, Springfield Township, Hamilton County, and Edward R. Purves, Forest Park, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed June 28, 1971, Ser. No. 157,622

Int. Cl. A23l *1/10*

U.S. Cl. 426—342 **8 Claims**

A process for making palatable ready-to-eat breakfast cereals containing soy protein. The incorporation of from 0.2 to 2.0% sodium bicarbonate in a soy protein-fortified cereal food results in the removal of objectionable soy flavor and the emergence of a high intensity, well-rounded, pleasant flavor.

3,814,825

PROCESS OF PRODUCING A CHUNKED CHEESE-FLAVORED PRODUCT

Earl J. Gilmartin, Jr., 1108 E. Plateau Road, Spokane, Wash. 99203; Alfred E. Allen, Jr., 16003 Inglewood Road, Bothell, Wash. 98011; and Donald R. Meeder, 2721 Alameda, San Mateo, Calif. 94403

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,892

Int. Cl. A23c *19/12*

U.S. Cl. 426—361 **10 Claims**

A chunked synthetic cheese-flavored product suitable for use as any true cheese in salad dressings, dips, dehydrated foods, sauces, etc., is produced by admixing a finely comminuted cheese-flavored dry material into a molten blend of hard and soft fats and by cooling and chunking the admixture into discrete chunks.

3,814,826

PROCESS FOR IMPROVING THE AROMA RETENTION OF FREEZE-DRIED COFFEE PRODUCTS

Timothy Andrew Lubsen, Springfield Township, Cincinnati, Jayantilal Mohanbhai Patel, Cincinnati, and Robert Aurand Cody, Wyoming, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 17, 1972, Ser. No. 254,011

Int. Cl. A23f *1/04*

U.S. Cl. 426—388 **9 Claims**

A process for improving the aroma retention, aroma character, and appearance of freeze-dried coffee particles comprises uniformly wetting the surface of freeze-dried coffee particles with steam by passing the particles through a jet of steam or by some other suitable means. The steam is added to the coffee in a ratio of about 0.1 to about 1.5.

ELECTRICAL

3,814,827

METHOD AND APPARATUS FOR FLOATING ZONE MELTING OF A SEMICONDUCTOR ROD

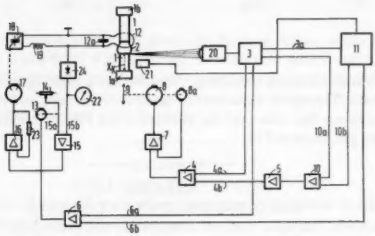
Hans Stut, Grobenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 25, 1973, Ser. No. 400,702

Claims priority, application Germany, Sept. 28, 1972, 2247651; June 28, 1973, 2332968

Int. Cl. H05b *5/08, 9/00*

U.S. Cl. 13—1 **15 Claims**



Floating zone melting of a silicon rod is monitored by a television camera which provides electrical pulses for controlling the melting zone to a programmed diameter and tangent angles of the melting zone profile.

3,814,828

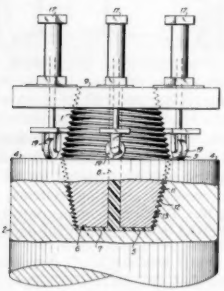
NIPPLE-ELECTRODE ASSEMBLY

Irving William Gazda, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Division of Ser. No. 113,995, Feb. 9, 1971, Pat. No. 3,717,911. This application Dec. 7, 1972, Ser. No. 312,809

Int. Cl. H05b *7/14*

U.S. Cl. 13—18 **4 Claims**



The invention relates to nipple-electrode assemblies and joints, such as those used in electric arc furnaces, and to a means of distributing thread clearance throughout the assembly and/or joint. These means include the pre-positioning of the nipple in the socket of the electrode section into which the nipple is threaded so as to provide a clearance between the non-load bearing flanks of the threads of said threaded nipple and said threaded electrode socket and the placing within the space between the base of the nipple and the bottom of the socket of the electrode section a hot, non-gaseous fluid, carbonizable material which solidifies upon cooling, thereby preparing a preassembly wherein the nipple is fixed in the electrode section, thereby maintaining the aforedescribed pre-positioning and thread clearance and thereby also providing room for thermal expansion of the threads of the connection. The hot, carbonizable material is introduced into the space between the base of the nipple and the bottom of the socket, while in a hot, fluid condition, through a hole in the nipple after the nipple has been threaded into the electrode socket, after which the carbonizable material solidifies. Upon connection of the projecting end of the nipple into a socket of an electrode section and use in a column of electrodes in an electric arc furnace, the solidified carbonizable material again becomes heated, melts and some of it flows downwardly through the hole into the corresponding space in the socket of the electrode section of the column and then becomes solid and carbonizes due to the heat encountered, thereby locking the nipple in the sockets of both electrode sections joined.

3,814,829

DEVICE FOR ELECTRON-BEAM HEATING OF MATERIALS MAINLY FOR THEIR MELTING AND EVAPORATION

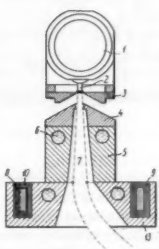
Boris Alexeevich Movchan, Ulitsa Darvina, 7, kv. 7; Viktor Alexandrovich Timashov, Ulitsa Prazhskaya, 3, kv. 223, and Vyacheslav Nikolaevich Germanchuk, Rusanovskaya Naberezhnaya, 12/1, kv. 3, all of Kiev, U.S.S.R.

Filed July 28, 1972, Ser. No. 276,037

Claims priority, application U.S.S.R., Oct. 26, 1971, 1706901

Int. Cl. H05b *7/00*

U.S. Cl. 13—31 **4 Claims**



A device is disclosed which relates to devices for vacuum-heating of materials. The device for electron-beam heating of materials, preferably for their melting and evaporation, comprises an electron-beam gun forming a ribbon electron beam; and an electromagnetic system for controlling said ribbon electron beam with a closed magnetic circuit having a rectangular shape and cores in which deflection coils are disposed, said device according to the invention being characterized in that the deflection coils are located on long opposing cores of said magnetic circuit, the short opposing cores of said magnetic circuit being mounted with additional coils for correcting and scanning of said beam, the deflection, correction and scanning coils being electrically associated with each other. The device may prove useful for melting and evaporation of metallic and non-metallic materials.

3,814,830

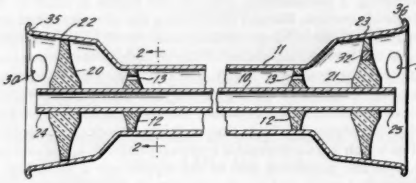
LOW DIELECTRIC STRESS TERMINATION FOR GAS-INSULATED TRANSMISSION SYSTEM

John C. Cronin, and David S. Dodge, both of Greensburg, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Feb. 5, 1973, Ser. No. 329,433

Int. Cl. H01b 9/06

U.S. Cl. 174—22 C **7 Claims**



Gas-insulated bus sections are factory assembled and pressurized and are provided with sealed large diameter end sections which form enlarged volume connection regions for connecting adjacent sections. The enlarged diameter connection regions of adjacent sections are connected in the field and filled with dielectric gas.

3,814,831

METAL-ENCLOSED HIGH VOLTAGE LINE

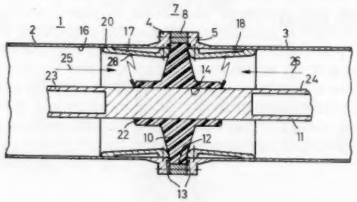
Willi Olsen, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munchen, Germany

Filed Nov. 23, 1971, Ser. No. 201,464

Claims priority, application Germany, Nov. 27, 1970, 2059330

Int. Cl. H01b 9/04

U.S. Cl. 174—28 **4 Claims**



A disc-shaped insulating body coaxially mounted on an electrical conductor supports the conductor in a surrounding metal enclosure. The insulating body fills in the inner cross-section of the enclosure preferably in a gas-tight manner. A sealed flame-resistant ring is provided at the inner surface of the enclosure adjacent the insulating body and has a length in axial directions which is greater than the length in axial directions of the insulating body and which is at least 100 mm. The ring protects the enclosure from burnout or melting which may be caused by a light arc driven toward the insulating body by current forces.

3,814,832

CABLE DRAWN THROUGH POLYMER TUBE WITHIN POLYMER HOUSING FOR ELECTRICAL TRANSMISSION

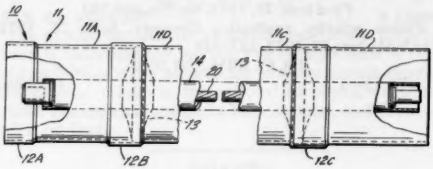
John C. Cronin, Greensburg, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed May 21, 1973, Ser. No. 362,439

Int. Cl. H01b 9/04

U.S. Cl. 174—28 **11 Claims**

A gas insulated power transmission system having a stranded cable conductor that extends coaxially inside a cylindrical enclosure and through a reinforced plastic tube arranged centrally within the enclosure. The cable is allowed to expand radially so that axial expansion is not needed. Expansion joints may be required for the tube. To provide the optimum dielectric shielding, the tube has a high dielectric constant. The space between the cable and the tube and the space between the tube and the enclosure are filled with an insulating gas, such as SF_6.



3,814,833

ELECTRIC EQUIPMENT CHANNEL

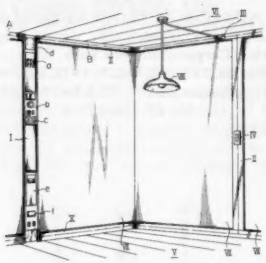
Kiyoshi Yamada; Tadashi Kobayashi, and Kazushige Morisue, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed June 13, 1972, Ser. No. 262,300

Claims priority, application Japan, June 14, 1971, 46-42292; June 14, 1971, 46-42295; June 14, 1971, 46-42296

Int. Cl. H02g 3/28

U.S. Cl. 174—48 **1 Claim**



A pillar-shaped electric equipment channel fixed between the ceiling and the floor of a building for controlling concentratively all electric systems required for all living functions such as power system, alarming systems, communicating systems and the like. Respective main control devices of these systems are all fitted in the channel substantially on one surface thereof.

3,814,834

ELECTRICAL OUTLET BOX

James Glader, 5433 Aldrich Ave., South, Minneapolis, Minn. 55430

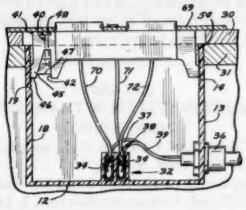
Filed Nov. 13, 1972, Ser. No. 305,930

Int. Cl. H02g 3/12

U.S. Cl. 174—57 **11 Claims**

An electrical outlet system in which an outlet box includes integrally formed connectors comprised of wells formed of insulating material and releasable conductive springs to receive

and retain conductors and lateral grooves on opposed end walls adapted to be engaged by like opposed outwardly extending ribs on the ends of an electrical device such as a switch. One end of the electrical device includes an adjustment to releasably lock the device in the box. An extender for the box is provided with opposed dovetail tabs which serve to coact with dovetail grooves near the top of opposed side walls on the box. The extender may be installed or removed by moving its other opposed walls together.

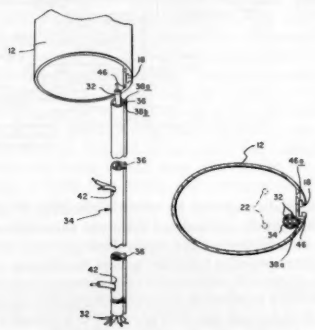


3,814,835

MAST CABLE ASSEMBLY

Carl Alan Merry, Marion, Mass., assignor to Schaefer Marine Products, New Bedford, Mass.

Filed Mar. 15, 1973, Ser. No. 341,712
Int. Cl. B63b *15/00;* **H02g** *3/02*
U.S. Cl. 174—70 R **6 Claims**



In order to protect the electrical cables extending up through a hollow sailboat mast, the cable is inserted side-ways into a split tube made of flexible, impact-resistant material. The tube has an exterior longitudinal bead which is slid into a correspondingly-shaped keyway formed on the inside wall of the mast to hold the tube against the mast wall.

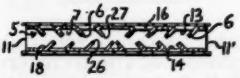
3,814,836

CONNECTOR FOR INSULATED CONDUCTORS

Dory J. Neale, Sr., St. Petersburg, Fla., assignor to National Telephone and Supply Co., Cleveland, Ohio

Continuation-in-part of Ser. No. 181,649, Sept. 20, 1971, abandoned. This application July 17, 1972, Ser. No. 272,391
Int. Cl. H02g *15/08*
U.S. Cl. 174—84 C **16 Claims**

A connector for electrically joining insulated conductors without removing the insulation therefrom. The connector is a generally channel shaped metal member with a plurality of protuberances struck from and extending inwardly from opposed walls thereof, said protuberances being inclined away from adjacent ends. The channel member has a covering layer or jacket of electrically non-conducting material which extends over certain edges for sealing engagement, said jacket preventing contact of the metal portions of the connector with other electrical conducting material. The connector receives conductors between the walls and in response to crushing force thereon the protuberances penetrate insulation of the conductors and curve away from adjacent ends of the connector to hold the conductors and make electrical contact with



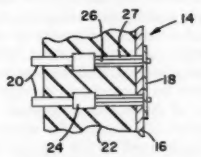
the wires therein. The crushing provides a crimp whereby the walls remain in the conductor engaging position. A flowable plastic or like material filling the interior of the connector forms a substantially solid encapsulation of the electrical connections of the conductors and connector member to provide an air and moisture tight structure for protection against atmospheric conditions.

3,814,837

CONNECTOR ADAPTER DEVICE

John B. Peach, and William E. McEachnie, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1972, Ser. No. 300,043
Int. Cl. H05k *1/04*
U.S. Cl. 174—88 R **1 Claim**



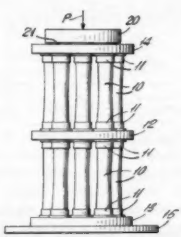
A device for use in connecting electrical components in missile circuits. The device includes a card having a printed electrical circuit thereon and wires to connect the circuit to connector pins in the device. Thus electrical continuity is provided from an electrical source to an unlimited number of connector pins.

3,814,838

INSULATOR ASSEMBLY HAVING LOAD DISTRIBUTION SUPPORT

James F. Shafer, Dallas, Tex., assignor to Continental Electronics Manufacturing Company, Dallas, Tex.

Filed June 1, 1973, Ser. No. 365,930
Int. Cl. H01b *17/14*
U.S. Cl. 174—150 **11 Claims**



A ceramic insulator assembly includes a plurality of parallel vertical insulators arranged with equal spacings about the cir-

cumference of a circle. Vertical loading forces are applied to the insulators by way of an adapter plate separated from a top plate on the insulators by a load distribution ring. The ring is aligned with the axes of the insulators, so that bending forces are not transferred to the insulators. A plurality of vertical tiers of insulators separated by divider plates may be provided. One end of each insulator may be mounted in a molded joint to insure substantially equal load distribution.

3,814,839

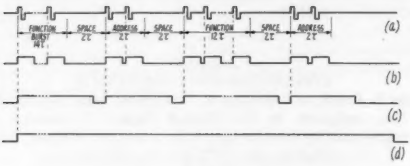
REMOTE DIGITAL SWITCHING TECHNIQUE FOR USE ON COMMUNICATIONS CIRCUITS

Andre Lubarsky, Jr., Sunnyvale, and Richard E. Pospisil, Los Altos, both of Calif., assignors to Telecommunications Technology, Inc., Sunnyvale, Calif.

Filed May 8, 1972, Ser. No. 251,353

Int. Cl. H04l 11/12

U.S. Cl. 178—2 C **17 Claims**



A plurality of remote switching modules are positioned along a telephone communication circuit and are responsive to signals sent by a control unit along the same circuit. The control unit signal includes a plurality of bursts of bipolar digital pulses having a certain format with timed spaces between each burst of pulses. Each remote module counts the pulses received from the control unit through the communications circuit. One of the modules responds when addressed with a burst of pulses of a number for which the module has been uniquely programmed. When a given module has been addressed, another burst of pulses tells the addressed module what switching function to perform.

3,814,840

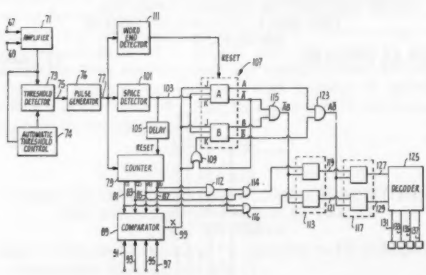
REMOTE DIGITAL SWITCHING TECHNIQUE FOR USE ON COMMUNICATIONS CIRCUITS

Andre Lubarsky, Jr., and G. Scott Warner, both of Sunnyvale, Calif., assignors to Telecommunications Technology, Inc., Sunnyvale, Calif.

Filed , Ser. No. 251,354

Int. Cl. H04l 11/12

U.S. Cl. 178—2 C **9 Claims**



A plurality of remote switching modules are positioned along a telephone communication circuit and are responsive to signals sent by a control unit along the same circuit. The control unit signal includes a plurality of bursts of bipolar digital pulses having a certain format with timed spaces between each burst of pulses. Each remote module counts the pulses received from the control unit through the communications circuit. One of the modules responds when addressed with a burst of pulses of a number for which the module has been uniquely programmed. When a given module has been addressed, another burst of pulses tells the addressed module what switching function to perform.

3,814,841

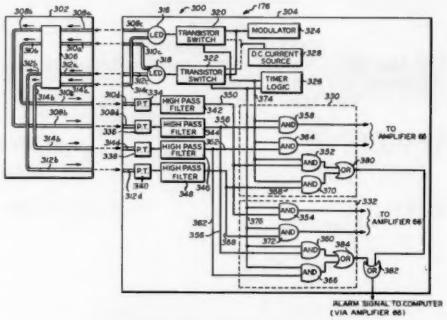
COMMUNICATION SYSTEM WITH PREMISES ACCESS MONITORING

Edward M. Ulicki, East Paterson, N.J., assignor to Telebeam Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 235,167, March 16, 1972, Pat. No. 3,757,225. This application Oct. 2, 1972, Ser. No. 294,310

Int. Cl. H04n 1/44; H04q 5/00

U.S. Cl. 178—5.1 **32 Claims**

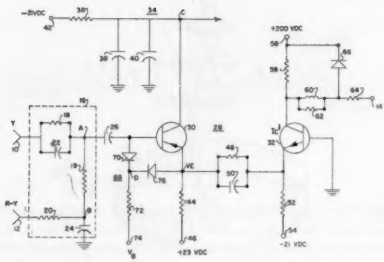


A communication system by which a plurality of substantially simultaneously transmitted different subscription programs may be selectively individually displayed on a common display channel provides premises access monitoring in addition to such display. A multiplexed communication signal containing a plurality of different program information signals and a plurality of command signals is provided to a plurality of display devices which are capable of substantially simultaneously displaying different selected program information displays from the plurality of such signals in response to selected program information signals. Each display device has an associated means for controlling the selection of these programs which is connected to a common condition responsive means, such as a computer. The control means includes means for demultiplexing the communication signal and for generating a given program information selection control signal in response to a uniquely identified command signal which control signal, when mixed with the demultiplexed plurality of subscription program information signals, provides the selected one at the frequency of the common display channel. The computer and common communication signal path thereto are utilized to provide premises access monitoring, in which instance an optical card reader utilizing fiber optics provides input conditions to the computer indicative of both the status of the door to the premises and the authorization of the entrant, a randomly selected insertable card providing the information to the computer through the reader. Such reader may employ a modulated light source, light polarization, or space and/or time diversity in order to increase the security of the reader. In addition, a pair of separate input devices, such as a card reader and a door position sensor may be utilized for such monitoring.

3,814,842
RGB AMPLIFIER

Sanjar Ghaem-Maghami, Chesapeake, Va., and Edward P. Surowiec, Clinton, N.Y., assignors to General Electric Company, Portsmouth, Va.

Filed Apr. 9, 1973, Ser. No. 349,610
Int. Cl. H04n *9/52*
U.S. Cl. 178—5.4 MA **14 Claims**

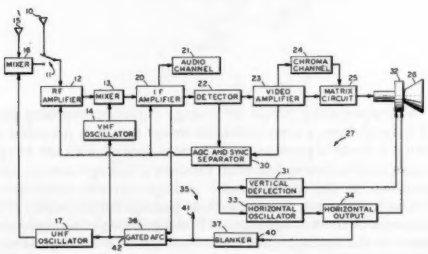


A passive matrixing network is provided for combining the color difference signals with the luminance signal. The network feeds into a high input impedance amplifier which enables large value resistors to be used in the matrix to prevent cross coupling of the color difference signals. AC coupling from the matrix and DC level restoration avoids DC interface problems between the luminance and color difference circuitry and the chrominance amplifier. The combination of positive and negative power supplies for the amplifier and the isolation provided by the high input impedance permits low level simplified brightness control circuitry to establish the DC restoration circuitry. In addition, the driver input stage of the chrominance amplifier is switchable to provide isolation to the DC restoration circuit during blanking and to provide a short time constant for this circuit to obtain full realization of the DC level with in the alloted time period. Also the power output stage is both very stable and provides protection from cathode ray tube arcing.

3,814,843
GATED AFC CIRCUIT

William Frank Kruszewski, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,154
Int. Cl. H04n *5/50*
U.S. Cl. 178—5.8 AF **2 Claims**

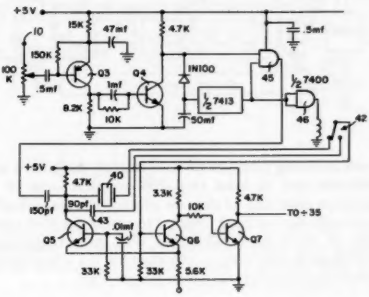


A gated automatic frequency control circuit is illustrated wherein the AFC circuit is gated to develop a frequency error signal during horizontal retrace intervals.

3,814,844
PRECISION DRIVE FOR VIDEO DISC RECORDER USING A FREE RUNNING OR CRYSTAL CONTROLLED OSCILLATOR

Edward C. Waldspurger, and William E. Nichols, both of Dayton, Ohio, assignors to Arvin Industries, Inc., Columbus, Ohio

Filed Feb. 5, 1973, Ser. No. 329,571
Int. Cl. H04n *5/78*
U.S. Cl. 178—6.6 P **4 Claims**

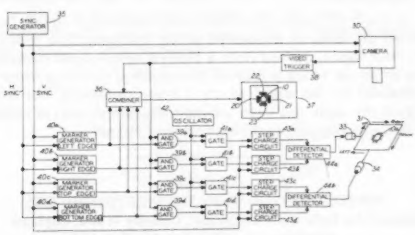


A magnetic disc video recorder has a phase locked servo loop control for the disc drive. If an incoming signal is present, the horizontal sync information is separated from it and used to key a free running oscillator which in turn provides a reference signal to the servo loop. When no equalizing pulses are present in the incoming signal, the oscillator rings through the vertical interval. If there is no incoming signal, the oscillator is automatically converted to a crystal controlled oscillator.

3,814,845
OBJECT POSITIONING

Robert William Hurlbrink, III, Sinking Spring, and Liber Joseph Montone, Reading, both of Pa., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J., by said Robert William Hurlbrink, III and Western Electric Company, New York, N.Y., by said Liber Joseph Montone

Filed Mar. 1, 1973, Ser. No. 337,265
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **16 Claims**



An object, such as a beam-leaded semiconductor chip, is accurately positioned, despite irregularities in its edges. A television camera produces video signals representing line-by-line scannings of the object. Video signals representing object edge position markers are also generated. The amount of overlap between the marker signals and the camera signals is measured over a plurality of line scans, and the results of these measurements are averaged. This average is used to control object position.

3,814,846

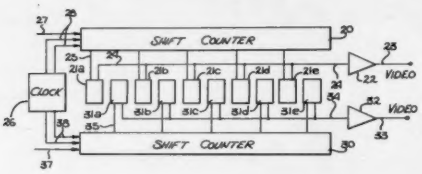
HIGH DENSITY PHOTODETECTION ARRAY

Edward H. Snow, Los Altos, Calif., assignor to Reticon Corporation, Mountain View, Calif.

Filed Jan. 20, 1972, Ser. No. 219,357

Int. Cl. H04n *1/04;* **H01j** *39/12*

U.S. Cl. 178—7.1 **8 Claims**



A self-scanning photodiode array which includes a row of photodiodes and at least two shift counters, one or more disposed on each side of the row of photodiodes is disclosed. The photodiodes are each coupled to one of the shift counters and one of two or more video lines. With this arrangement not only a higher density array is achieved but the scanning rate of the photodiodes is increased over the prior art.

3,814,847

TELEVISION SIGNAL PROCESSING DEVICE

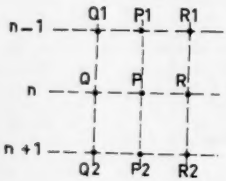
Maurice Longuet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 27, 1971, Ser. No. 211,981

Claims priority, application France, Oct. 26, 1971, 71.38452

Int. Cl. H04n *5/14*

U.S. Cl. 178—7.1 **5 Claims**



In order to obtain a contour corrected image signal, from which the noise is eliminated in the transition-free zones, a contour signal, derived from a blurred image signal (translating an image which is blurred as compared with that which is translated by the signal which is being processed, but from which the noise has been substantially eliminated) is added, with a suitable gain, to the blurred image signal.

3,814,848

PHOTOGRAPHIC TYPE FACE REPRODUCERS

Derek John Kyte, 117, Valley Rd., Chorley Wood, England

Filed Nov. 30, 1972, Ser. No. 310,683

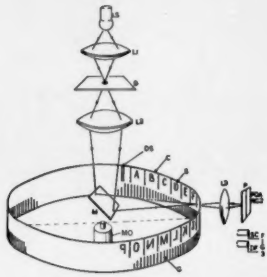
Claims priority, application Great Britain, Dec. 9, 1971, 57421/71

Int. Cl. H04n *1/06*

U.S. Cl. 178—7.1 **7 Claims**

The signals required to control reproduction of characters on the print-out cathode ray tube in a photo-typesetting machine consist of a series of binary codes indicating successive line positions in a raster at which the beam is to be switched on and off in re-forming a character on the print-out tube.

To create such a binary code series, a ring of transparent characters on a rotary opaque carrier (or vice-versa) are selectively illuminated from one side of the ring for flooding each required character in turn as the carrier rotates and a line of miniature photo-diode devices is arranged on the other side of the ring in scanning position relative to the illuminating means to detect and signal the physical two-dimensional posi-



tion on a raster basis in a character area of each ON and OFF change in illumination on the diodes.

Detector means successively scan the photo-diodes at high speed relative to the rotational speed of the character carrier and detect the ON and OFF changes in their electrical condition the coordinate positions of which in a character area are signalled to code-responsive means.

3,814,849

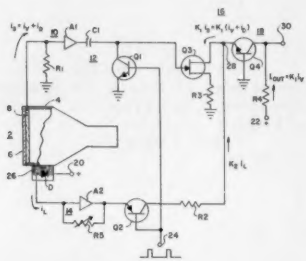
LEAKAGE CURRENT COMPENSATING CIRCUIT FOR SEMICONDUCTOR IMAGE SENSOR

Hans R. Bucher, Boulder, and David H. Wartburg, Broomfield, both of Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Oct. 13, 1972, Ser. No. 297,516

Int. Cl. H04n *5/34*

U.S. Cl. 178—7.2 **9 Claims**



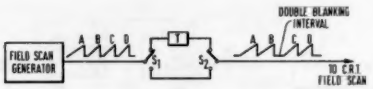
A compensating circuit for leakage current comprising part of a signal from a semiconductor image sensor is provided in which a diode is positioned in thermal contact with the image sensor and is reverse biased to produce a leakage current proportional to the image sensor leakage current. Amplifying means is utilized to provide a diode leakage current signal proportional to the leakage current flowing through the diode and equal to the leakage current component of the image sensor signal. The diode leakage current signal and the image sensor signal are summed in a summing circuit such that the diode leakage current signal offsets the leakage current component of the image sensor signal. An output signal results in which the image sensor leakage current component is substantially eliminated.

3,814,850

FLYING SPOT FILM SCANNER PROVIDING INCREASED TIME FOR FILM PULL-DOWN

Raymond Matchell, Ongar, England, assignor to The Rank Organization Limited, London, England

Filed Oct. 27, 1972, Ser. No. 301,278
Claims priority, application Great Britain, Oct. 27, 1971, 49890/71
Int. Cl. H04n 5/36
U.S. Cl. 178—7.2 11 Claims



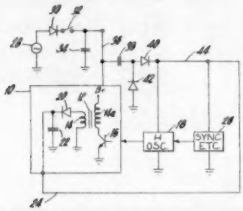
A flying spot scanner for producing a television video signal from a motion picture film in which a period of time longer than the blanking interval between successive fields is available for film pull-down. The longer interval for film pull down is provided by delaying the production of the first field scan of each frame via a delay line, by an amount no greater than the field blanking interval, initiating the second field scan of each frame during a time interval immediately following the first field scan and of a duration less than the normal blanking interval between frames. The pulling down or advancing of the film one frame is done during the longer than blanking interval period of time between the second field scan of one frame and the first field scan of an immediately following frame. The delay can be provided by a delay line which delays the field scan signal for the first field scan of a frame. The resulting video signal is retimed so the picture information containing portions are separated by the normal field blanking interval. The retiming can be accomplished by the same delay line used to provide the double blanking interval, via electronic switching which alternately switches the delay line into the outputs of a field scan generator and a video processor.

3,814,851

LOW VOLTAGE D.C. SUPPLY CIRCUIT

Yutaka Nakagawa, and Masao Suzuki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 28, 1972, Ser. No. 275,950
Claims priority, application Japan, Aug. 13, 1971, 46-72466
Int. Cl. H04n 5/44
U.S. Cl. 178—7.3 R 5 Claims



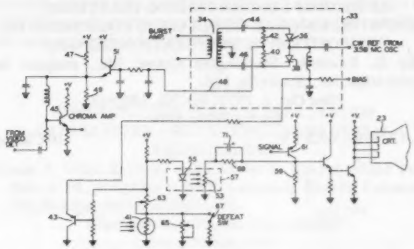
A low voltage D.C. supply circuit for use in a transistorized television receiver in which a high frequency alternating signal from an extra winding in the horizontal output or flyback transformer is rectified to supply a low voltage D.C. current to the horizontal oscillator and automatic synchronization circuits. In order to cause the horizontal oscillator to begin oscillations an initial pulse is taken from the transformerless main power supply of the television receiver and is rectified and supplied to the horizontal oscillator.

3,814,852

AMBIENT LIGHT RESPONSIVE CONTROL OF BRIGHTNESS, CONTRAST AND COLOR SATURATION

Eugene P. Mierzwinski, Fort Wayne, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.

Filed Nov. 27, 1972, Ser. No. 309,872
Int. Cl. H04n 5/16, 5/68
U.S. Cl. 178—7.5 DC 3 Claims



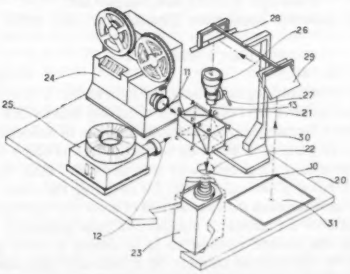
A circuit deployed in a color televison receiver for varying the brightness, contrast and color saturation of a displayed picture in accordance with variations in ambient light in the vicinity of a receiver screen is disclosed comprising a light sensing means mounted near the receiver screen and having an electrical parameter which varies in accordance with variations in the light incident on the light sensing means and means responsive to those variations in the electrical parameter for varying the gains imparted to both the luminance and chrominance signals. In the disclosed preferred embodiment the light sensing means is a light dependent resistor such as a simple cadmium sulphide cell the resistance of which varies in response to changes in the light impinging thereon. These variations in resistance are used to control the gain of both the chrominance and the luminance amplifiers of the receiver and in one preferred embodiment these resistance variations were transferred by way of a light emitting diode and second light dependent resistor to the luminance amplifier stage in order to isolate the luminance amplifier from the original light dependent resistor.

3,814,853

VARIABLE-FIELD MIXER FOR TELEVISION TRANSMISSIONS

Jacques Lardeau, Rosny-sous-Bois, France, assignor to Societe d'Optique, Precision Electronique et Mecanique-SOPELEM, Paris, France

Continuation of Ser. No. 100,692, Dec. 22, 1970, abandoned.
This application Nov. 14, 1972, Ser. No. 306,297
Claims priority, application France, Dec. 31, 1969, 69.45627; France, June 12, 1970, 70.21585
Int. Cl. H01j 29/89
U.S. Cl. 178—7.85 2 Claims



A variable feed mixer which includes two semi-reflective blocks for location in front of a television camera lens

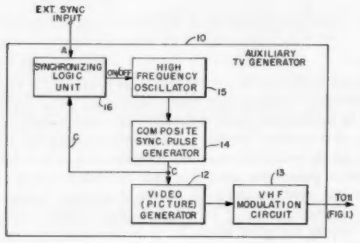
focussed for infinity and defining three injection apertures for receiving images from three sources, a variable focal length lens of the zoom type generally comprising a primary lens associated with the varying element, the primary lens having been removed being positioned in front of one of the injection apertures.

3,814,854

METHOD OF SYNCHRONIZING TELEVISION COMPATIBLE SIGNAL GENERATING EQUIPMENT TO COMPOSITE SYNCHRONIZATION SIGNALS

Philip K. Edwards, Washington Grove, Md., assignor to Datavision, Inc., Rockville, Md.

Filed Oct. 4, 1971, Ser. No. 186,155
Int. Cl. H04n *5/04*
U.S. Cl. 178—69.5 TV **10 Claims**



To synchronize vertical and horizontal sync pulses produced by an auxiliary television generator, external reference sync pulses received via standard transmission are inverted and applied to the input of an AND gate along with the uninverted internally-generated sync pulses. The output of the AND gate is inverted and applied to start and stop a fixed-frequency oscillator providing the time base for internal sync pulse generation. The oscillator is turned off intermittently by the inverted AND gate output to delay the internal sync pulse signal sufficiently to correct for its overall phase difference relative to the reference sync pulse signal. Individual sync pulses are also delayed to correct for frequency mismatch so long as the internal sync signal frequency is from zero to 8 percent higher than the external signal frequency.

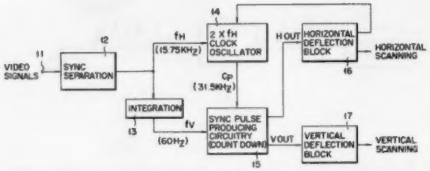
3,814,855

SYNCHRONIZING SIGNAL PRODUCING SYSTEM FOR A TELEVISION DEVICE

Naoyuki Kokado, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Saiwai-ku, Kawasaki-shi, Japan

Filed Apr. 4, 1973, Ser. No. 347,692
Claims priority, application Japan, Mar. 31, 1972, 47-31713
Int. Cl. H04n *5/04*
U.S. Cl. 178—69.5 TV **5 Claims**

A synchronizing signal producing system for a television device comprises a first counter for receiving input clock pulses having a frequency of an integral multiple of a horizontal synchronizing signal to generate output pulses having a vertical synchronizing frequency with a larger width than that of the clock pulse; a second counter for counting the clock pulses in synchronization with the arrival of a vertical synchronizing signal from the outside; a comparison pulse generator coupled with the second counter so as to derive a clock pulse counted, by the second counter, at a time corresponding to substantially the center of the width of the output pulse from the first counter; a phase comparator for comparing the phase of the output pulse from the comparison pulse generator with that of the output pulse from the first counter; and an output switching circuit for deriving as a vertical synchronizing output for the television device the output pulse of the first counter when the output pulse from the first counter and that from the comparison pulse generator are evaluated by the comparator to be in phase and the output pulse associated synchronously with the vertical synchronizing signal obtained from the outside through the second counter when they are



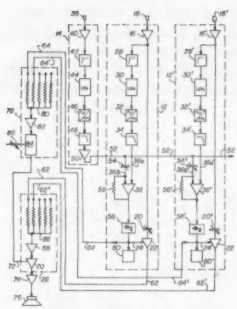
evaluated by the comparator to be out of phase, whereby the television device can be driven always in substantially synchronized condition not only in a case where the vertical synchronizing signal from the outside is equal in frequency to a standard vertical synchronizing signal, but also in a case where the received vertical synchronizing signal is somewhat different in frequency from the standard vertical synchronizing signal.

3,814,856

CONTROL APPARATUS FOR SOUND REINFORCEMENT SYSTEMS

Daniel E. Dugan, 3715 22 St., San Francisco, Calif. 94114

Filed Feb. 22, 1973, Ser. No. 334,947
Int. Cl. H04r *27/00*
U.S. Cl. 179—1 AT **10 Claims**

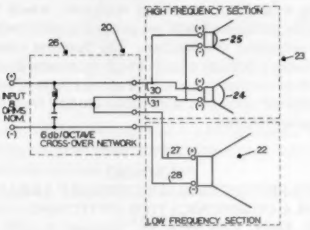


A control apparatus for a sound reinforcement system having plural audio input program microphones installed in a theater or like environment. The ambient sound or noise level in the environment is sensed and is employed to control each microphone individually so that a microphone is activated only if the audio material impinging thereon exceeds the ambient noise level. The audio output of the entire system is continuously and automatically adjusted so that the gain or amplification to which audio program signals are subjected is proportional to the number of program microphones that are active, thereby optimizing the operation of the system.

3,814,857
TWO-WAY LOUDSPEAKER SYSTEM WITH TWO TANDEM-CONNECTED HIGH-RANGE SPEAKERS

Norman Leonard Thomasen, 2166 Market St., San Francisco, Calif. 94114

Continuation-in-part of Ser. No. 873,861, Nov. 4, 1969, abandoned. This application June 3, 1971, Ser. No. 149,572
Int. Cl. H04r *3/04*
U.S. Cl. 179—1 D **7 Claims**

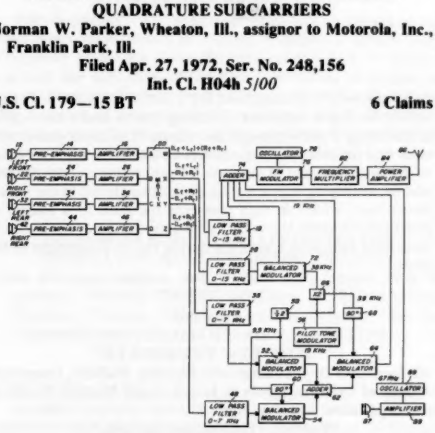


The high-frequency response and directional characteristics of a two-way loudspeaker system are improved by use of two specially differentiated nearly identical high-frequency speakers both identically connected in parallel to the crossover network. These two high frequency speakers are equally efficient in the region of their common high frequency assignment where their equal output is due to their equally constructed and exposed cone surfaces. However, they are unequal in efficiency in the higher region of the same common assignment where their unequallity in efficiency is due to a difference in the construction of the apex area of the speakers. The differences in efficiency of the two loudspeakers are such that their individual outputs are complementary and hence their combined output produces a substantially uniform level of acoustic output throughout their commonly assigned frequency range.

3,814,858
MULTIPLEX SYSTEM EMPLOYING MULTIPLE QUADRATURE SUBCARRIERS

Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 27, 1972, Ser. No. 248,156
Int. Cl. H04h *5/00*
U.S. Cl. 179—15 BT **6 Claims**

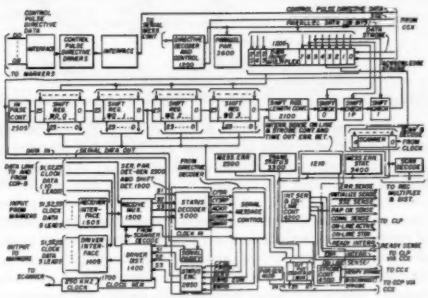


A system for broadcasting and receiving at least three stereophonically related audio components compatibly with present monophonic and stereophonic transmissions and receptions within the alloted bandwidth of present FM broadcast transmitters. Signals representative of the sum and difference of two stereophonically related audio components are broadcast in the audio band and on a 38 KHz suppressed subcarrier, respectively. A third signal, including a third component, is broadcast on a second 38 KHz suppressed subcarrier in quadrature with the first subcarrier. A fourth component may be transmitted on a third higher frequency suppressed carrier, or at reduced bandwidth about additional subcarriers generated about the second suppressed subcarrier. The components are distributed among signals so that monophonic reception may be achieved by receiving only the signals in the audio band and so that each additional signal received allows the recovery of an additional component.

3,814,859
COMMUNICATION SWITCHING SYSTEM TRANSCEIVER ARRANGEMENT FOR SERIAL TRANSMISSION

James J. Vrba, Berwyn, and Charles K. Buedel, Wood Dale, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 2, 1973, Ser. No. 320,412
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AL **21 Claims**



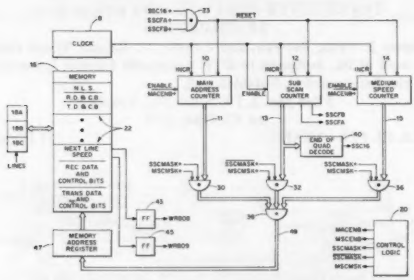
A serial transceiver arrangement for a communication switching system having a plurality of sub-system units, such as markers, and a common data processor unit includes a first serial communication transceiver register associated with the processor unit and a plurality of transceiver registers individually associated with each one of the sub-system units connected via two-way serial transmission links to the processor register by means of time division multiplexing circuits. A parallel communication link interconnects the common data processor unit with its communication register. Shift checking detectors are provided to determine the proper functioning of shift registers in the communication registers and to analyze a header bit pattern contained in each message. The serial register links each includes a serial data lead and a clock signal lead for supplying clock signals in synchronism with the serial data signals for operating a shift register of the receiving communication register. A scanner in the communication register associated with the data processor unit is sequentially incremented to access the links to the sub-system communication registers, and the data processor includes circuitry to interrupt the scanning operation to load the shift register of its communication register with a message to be sent to a particular subsystem communication register, while freezing the status of the processor communication register and advancing the scanner to the next link automatically. A parity detector and generator circuit is provided to supply a parity bit for each word of a message sent to the processor communication register from the sub-system register and the processor communication register checks the parity bit of each word of a message loaded in parallel into its shift register by the processor and sent in serial form to sub-system transceiver. The processor communication register can re-attempt to receive a sub-system communication register transmission in the event

of a parity error or a shift checking error, and for maintenance purposes the processor communication register can send a special message to the sub-system register with an instruction to return it unchanged for diagnostic purposes.

3,814,860
SCANNING TECHNIQUE FOR MULTIPLEXER APPARATUS

Anthony Pringle, Framingham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 16, 1972, Ser. No. 298,078
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 BA **21 Claims**

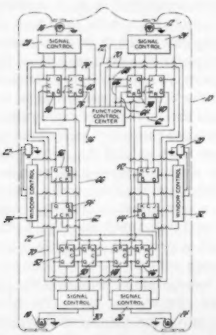


In a communications system comprising multiplexer apparatus for transferring data over any one of a plurality of communications lines, line scanning apparatus is provided to address and enable the transfer of data over any one of the communications lines, which lines are divided into groups characterized by the lines maximum frequency. The apparatus of the invention includes a main address counter which is used primarily to address low speed communication lines and thereby enable the transfer of data thereover, a sub scan counter which is utilized primarily to enable the transfer of data over high speed lines, and a medium speed counter which is utilized in combination with the other counters to address the medium speed lines under certain conditions.

3,814,861
VEHICLE MULTIPLEX CIRCUIT HAVING FUNCTION PRIORITY

Samuel B. Robbins, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1972, Ser. No. 299,954
Int. Cl. H04j *3/16*
U.S. Cl. 179—15 A **2 Claims**

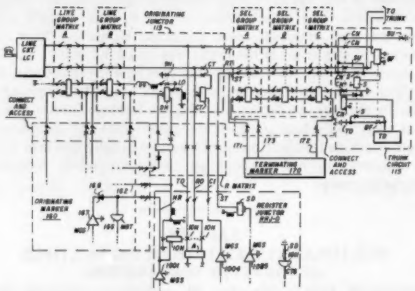


A power line, an address line and a plurality of flip-flops for generating sequential time slots are displaced around a vehicle. A function control center transmits clocking pulses to the flip-flops which sequentially generate time slots associated respectively with each function which can be performed on the vehicle and transmits an address signal on the address line synchronized with the time slot associated with a selected function to be performed to effect the initiation of that function. The function control center provides one form of control in which a control switch continually controls a function associated therewith while said switch is actuated and a second form of control in which another control switch is effective for initiating a function associated therewith, which function is continually performed until yet another control switch is actuated to terminate the function. The function control center also includes a priority circuit which momentarily disrupts the first form of control to permit the second form of control to effect a selected operation after which the first form of control is again made effective.

3,814,862
MATRIX-PROTECTING SUPERVISORY ARRANGEMENT FOR A COMMUNICATION SWITCHING SYSTEM

John W. Eddy, Villa Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 2, 1972, Ser. No. 303,156
Int. Cl. H04q *3/495*; **H04b** *15/00*
U.S. Cl. 179—18 GE **11 Claims**



A supervisory arrangement for a communication switching system having at least one switching matrix and a marker for establishing a path through the matrix to a supervisory unit, such as a register junctor, includes a seizure circuit responsive to the establishment of the path for generating a control signal and for supplying it to a matrix-protecting circuit in the supervisory unit, which in turn connects the path to a source of potential, whereby the matrix crosspoints are not subjected to unwanted switching transients during the establishment of the path.

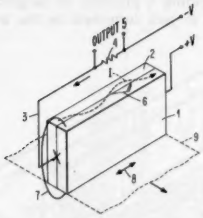
3,814,863
INTERNALLY BIASED MAGNETORESISTIVE MAGNETIC TRANSDUCER

Richard L. O'Day, Boulder, and Frank B. Shelledy, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1972, Ser. No. 296,743
Int. Cl. G11b *5/30*; **H01c** *7/16*
U.S. Cl. 360—113 **19 Claims**

A magnetic transducer exhibiting the magnetoresistive (MR) effect includes at least two thin film layers. A three-legged MR film in electrical contact with a higher resistivity layer is magnetically biased by a portion of the MR sense current shunted through the nonmagnetic layer. The need for an

accurate and stable bias to reduce distortion is eliminated by subjecting similar adjacent MR elements to opposite currents.



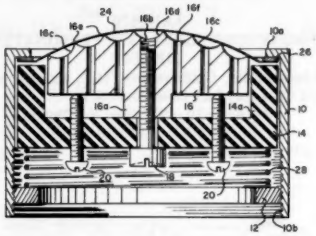
Each element is then symmetrically and oppositely biased so that a differential resistance sensing circuit provides an output signal relatively immune to distortion.

3,814,864

CONDENSER MICROPHONE HAVING A PLURALITY OF DISCRETE VIBRATORY SURFACES

John A. Victoreen, 350 N. Maitland Ave., Maitland, Fla. 32751

Filed July 14, 1972, Ser. No. 272,070
Int. Cl. H04r *19/00*
U.S. Cl. 179—111 R **12 Claims**



The diaphragm of a condenser microphone is broken up into many small pieces so that each attains a natural high frequency resonance above the range of sounds to be picked up with the sum total of the pieces providing an output as great as a single diaphragm with a lower impedance by providing a series of concentric ring contacts wih a diaphragm stretched over the rings, the highest points or ridges of which lie on a convex surface, to break up the diaphragm into annular sections.

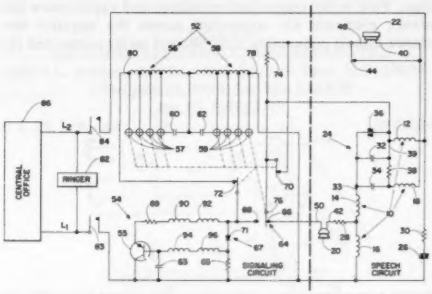
3,814,865

TELEPHONE SUBSTATION APPARATUS FOR GENERATING MULTIFREQUENCY SIGNALS

John Edward Critchley, and William John Haight, both of London, Ontario, Canada, assignors to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Jan. 8, 1973, Ser. No. 321,663
Int. Cl. H04m *1/50*
U.S. Cl. 179—84 VF **9 Claims**

A multifrequency signalling arrangement for a subscriber telephone set or other telephone substation circuit. In this arrangement a resonant circuit, comprising a pair of tapped inductors and associated capacitors, is connected in parallel with an amplifier, which forms part of a multifrequency oscillator, through a set of late-break contacts mechanically linked to each digit button on the selector pad. During the initial period of travel of a selected digit button a set of early-make contacts, also linked to the digit buttons, simultaneously enable the amplifier and energize the resonant circuit. At a later period of travel of the selected digit button the late-break contacts separate to interrupt the flow of direct current through



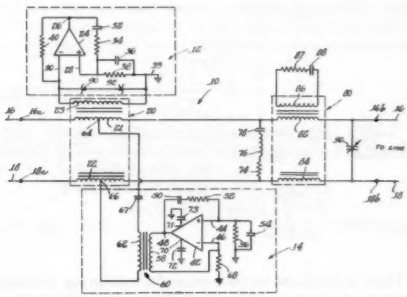
the resonant circuit and thereby initiate oscillations in said resonant circuit at the selected frequency which are supported by the yet enabled amplifier and transmitted to the telephone central office.

3,814,866

NEGATIVE RESISTANCE REPEATER

Ronald Japenga, Glendale Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Sept. 30, 1971, Ser. No. 185,167
Int. Cl. H04b *3/36, 3/16*
U.S. Cl. 179—170 G **3 Claims**



A negative resistance repeater is provided with a coupling transformer to be connected to communication lines for sensing the impedance of the lines and altering the matching impedance characteristic of the lines in accordance with communication signals being transmitted over the lines. Series and shunt negative resistance repeaters utilize operational amplifier circuits having a single output terminal with first and second input terminals. The operational amplifier develops both the positive and negative feedback signals from the single output terminal of the amplifier.

3,814,867

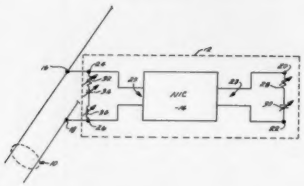
ACTIVE SHUNT IMPEDANCE FOR COMPENSATING IMPEDANCE OF TRANSMISSION LINE

C. Wendell Boucher, Huntington Beach, Calif., assignor to Communication Mfg. Co., Long Beach, Calif.

Filed Jan. 26, 1973, Ser. No. 326,594
Int. Cl. H04b *3/18*
U.S. Cl. 179—170 G **20 Claims**

An active shunt impedance compensating circuit for a two wire transmission line. A pair of output terminals connect

across the transmission line. A negative impedance converter has a negative impedance circuit connecting side and a positive impedance connecting side. The positive impedance circuit connecting side is coupled across the pair of output terminals. First series connected resistance and capacitance impedance elements are connected across the negative impedance circuit connecting side. Second series connected re-



sistance capacitance and inductance impedance elements are connected across the positive impedance circuit connecting side. A negative impedance converter is characterized, assuming an ideal transformation, for forming an equivalent circuit substantially equal to the negative of the first series connected impedance elements in parallel with the second series connected impedance elements.

3,814,868

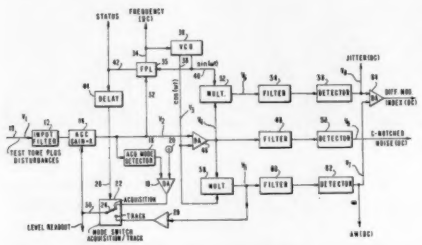
TELEPHONE LINE CHARACTERISTIC MEASURING INSTRUMENT

Frank R. Bradley, 9 Dash Pl., Bronx, N.Y. 10463

Filed July 12, 1972, Ser. No. 270,953

Int. Cl. H04b *3/46*

U.S. Cl. 179—175.3 R **22 Claims**



There is disclosed an instrument for measuring the characteristics of telephone lines to facilitate the identification of sources of data transmission errors. An automatic gain control circuit is used to normalize a received test tone signal so that the test tone component of the signal is made equal to the reference level of a local oscillator. The difference between the amplified test signal and the local oscillator output is then derived, leaving only the test signal disturbances. In addition to conventional-type test readings which may then be taken, a special measurement of interest is made which represents the relative influences of uncorrelated noise and true phase jitter on a phase jitter measurement so that the major source of measured phase jitter may be identified.

3,814,869

OUTGOING TRUNK EXTENDER TEST AND MONITOR APPARATUS FOR CENTRAL TELEPHONE EQUIPMENT

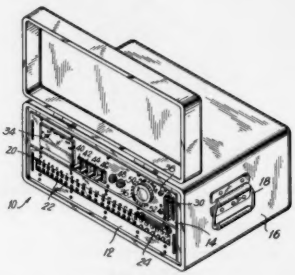
Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,723

Int. Cl. H04b *3/46*; **H04m** *3/00*

U.S. Cl. 179—175 **13 Claims**

An outgoing trunk (OGT) extender test and monitor apparatus for central telephone equipment, preferably of the panel and crossbar system types, for use in conjunction with the outgoing trunk test frame or board of said system, said apparatus comprising a trunk jack panel and a trunk test cabinet, means for connecting a plurality of outgoing trunks at the OGT test frame to jack terminals on the trunk jack panel,



means for connecting the trunk jack panel to the trunk test cabinet disposed at a position remote from the OGT test board, and the trunk test cabinet including means for testing the operating condition of the OGTs and, in particular, for the testing of new trunks and for the clearing of defective tandem, panel and crossbar trunk pairs.

3,814,870

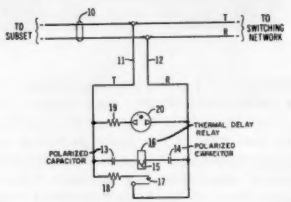
TELEPHONE SUBSCRIBER LINE TERMINATING TEST CIRCUIT

Harry Lloyd Miller, Gaithersburg, Md., assignor to Western Electric Company Inc., New York, N.Y.

Filed Sept. 19, 1972, Ser. No. 290,363

Int. Cl. H04b *3/46*; **H04m** *3/00*

U.S. Cl. 179—175.2 B **3 Claims**



A telephone line terminating test circuit for simulating a subscriber line subset to provide a properly timed off-hook signal responsive to a ringing current applied to the line. During precutover testing of a telephone switching system, the test circuit connects a subset simulating resistance across the line under control of a thermal relay operated responsive to the ringing current to simulate an off-hook state. The thermal relay is delayed in both its operate and restore phases to provide proper testing periods.

3,814,871

JOYSTICK CONTROLLER FOR MULTIPLE SWITCH ASSEMBLY

Thomas F. Osika, Gary, Ind., assignor to McGill Manufacturing Company Inc., Valparaiso, Ind.

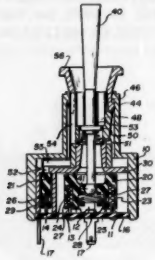
Filed Mar. 21, 1973, Ser. No. 343,352

Int. Cl. H01h *25/00*, *15/10*

U.S. Cl. 200—6 A **14 Claims**

A switch assembly for controlling a plurality of circuit connections includes a first switch section controlled by a joystick

actuator which moves a carriage having a plurality of conducting bridge contacts, and a second switch section controlled by a selector knob which moves a carriage having a further conducting bridge contact. The contacts are selectively engageable with a plurality of separate conductors positioned on one side of an insulated circuit board to provide the switch action.

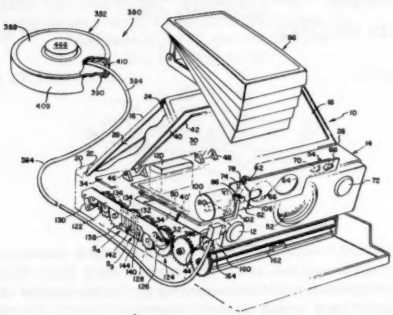


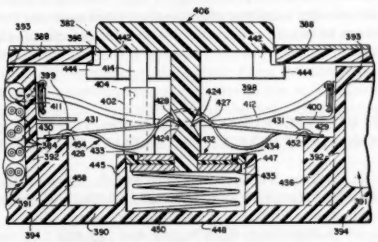
3,814,872

REMOTE CONTROL SYSTEM FOR PHOTOGRAPHIC APPARATUS

Leonard S. Magerman, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1972, Ser. No. 246,916
Int. Cl. H01h *43/28*
U.S. Cl. 200—33 R **19 Claims**





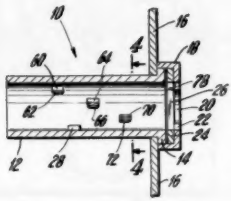
Photographic apparatus and an improved remote control system therefor which functions to carry out a series of operational events in response to the brief manual depression of a remote start switch. The photographic apparatus control system incorporates an electronic latch which is activated only after select initial ones of these operational events are carried out. Additionally, the control system incorporates a feature insuring the successful commencement of a photographic cycle by delaying the deactuation of the start switch after a brief depression thereof.

3,814,873

KEY OPERATED SWITCHING APPARATUS

Robert L. Roberts, 304 East 86th St., New York, N.Y. 10028

Filed July 25, 1972, Ser. No. 274,839
Int. Cl. H02j *3/38*
U.S. Cl. 200—44 **10 Claims**



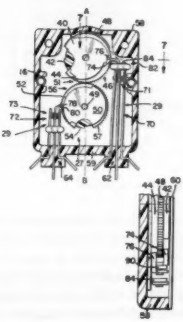
A key operated switching apparatus. The apparatus includes a hollow shaft for receiving one of a plurality of keys therewithin. A slotted cover plate is placed over one end of the hollow shaft for locating the key hole. Positioned between the cover plate and the one end of the shaft is a slotted guide plate for determining the initial position of the key as it is placed through the slot in the cover plate, then the guide plate, and into the hollow shaft. The hollow portion of the shaft contains a plurality of switch means positioned therewithin, each of said keys are so coded so as to rotate within said shaft in such a manner that one key could only close one of said switch means.

3,814,874

CAM-ACTUATED TIMER SWITCH

William R. Brown, Beech Grove, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Mar. 30, 1973, Ser. No. 346,313
Int. Cl. H01h *43/10*
U.S. Cl. 200—38 B **16 Claims**



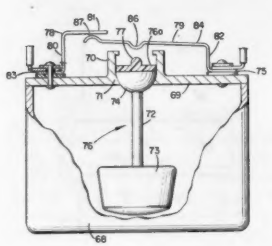
A cam-actuated timer switch, substantially thin in profile, utilizes two cam members rotating side-by-side and two sets of contact-carrying blades, each set being located on either side of a line through the centers of the two cam members.

3,814,875

PENDULUM OPERATED INERTIA SWITCH FOR SAFETY BELT MECHANISM WITH RECIPROCATING CAM FOLLOWER

Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 161,682, July 12, 1971, Pat. No. 3,740,000. This application Apr. 9, 1973, Ser. No. 349,609
Int. Cl. H01h 35/15
U.S. Cl. 200—61.48 9 Claims



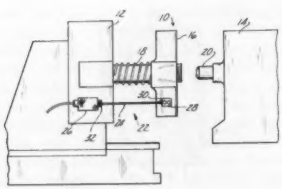
The inertia switch includes a vertical tubular member terminating at its bottom in an apertured spherical seat which swingably engages the spherical underface of a head formed at the top of a depending pendulum. The top of the head defines a flat faced cam which confronts the flat underface of a follower slideable in the tubular member and a resilient switch arm extends across the path of the follower to be actuated by the swinging of the pendulum.

3,814,876

SAFETY MECHANISM FOR MACHINE TOOLS

John J. Biafore, 38653 Foxcroft, Harrison, Mich. 48043

Filed Oct. 16, 1972, Ser. No. 298,015
Int. Cl. H01h 3/16
U.S. Cl. 200—61.58 R 7 Claims



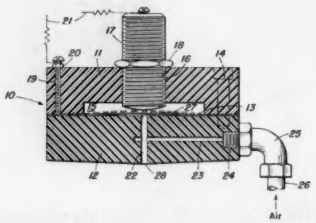
A safety mechanism for indexing machines, e.g., rotary dial type or, transfer machines, of the type having a multihead tool carrier, bushing plate, and fixture, includes a normally closed switching unit in electrical series with the transferring or indexing circuit and is mounted on the multihead. The mechanism further includes a flex cable mounted on the bushing plate, having means associated therewith for closing the switching unit; the flex cable being of a preselected length such that an open circuit is provided unless the bushing plate is in its normal position on the multihead.

3,814,877

PRESSURE SWITCH WITH DIAPHRAGM AND ADJUSTABLE CONTACT

William Alvarez, Placentia, Calif., assignor to Jonathan Manufacturing Company, Fullerton, Calif.

Filed Oct. 17, 1972, Ser. No. 298,368
Int. Cl. H01h 35/34
U.S. Cl. 200—83 N 1 Claim



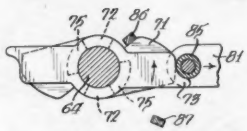
A flexible polymeric-metal laminate diaphragm is used in a pressure responsive switch for engaging and disengaging switch terminals in accordance with periodic changes in pressure.

3,814,878

CIRCUIT BREAKER OPERATING MECHANISM

Donald E. Weston, East Sebago, Maine, and Raymond F. Kupetis, Chicago, Ill., assignors to H. K. Porter Company, Inc., Chicago, Ill.

Division of Ser. No. 24,079, March 31, 1970, Pat. No. 3,673,426. This application Apr. 6, 1972, Ser. No. 241,714
Int. Cl. H01h 33/66
U.S. Cl. 200—144 B 9 Claims



A circuit breaker comprised of a shunt switch, vacuum tube interrupter switches and a disconnect switch blade housing said interrupter switches is operated by the mechanism of the invention in a switch opening sequence wherein the shunt switch is opened first, the interrupter switches are then opened at high speed and the disconnect blade is swung open immediately following opening of the interrupter switches, and in a closing sequence wherein the circuit is closed through the shunt switch to relieve the interrupters of circuit closing stresses.

3,814,879

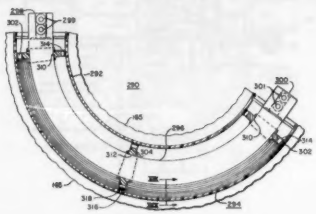
CIRCUIT INTERRUPTER WITH IMPROVED TRAP FOR REMOVING PARTICLES FROM FLUID INSULATING MATERIAL

Alan H. Cookson, Pittsburgh; Owen Farish, Monroeville, and John M. Gauntz, Trafford, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 9, 1971, Ser. No. 122,453
Int. Cl. H01h 9/30
U.S. Cl. 200—144 1 Claim

A circuit interrupter including a dielectric particle trapping structure interposed between two conductors of a generally concentric arrangement which forms part of the circuit interrupter and to which a high voltage may be applied. The particle trap is particularly adapted for use with a fluid insulating

system, more specifically a gaseous insulating medium such as sulfur hexafluoride. The particle trap may be disposed in the vicinity of a critical section of a high voltage conductor, where the presence of extraneous particles of dielectric or metallic material, which are suspended within the fluid may trigger high voltage breakdown if not removed. The particle trap may also be disposed proximate to an inner electrode barrier. Since the particle trap may be a dielectric material which has either

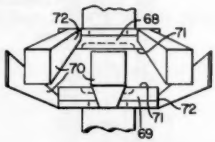


corrugations or holes in it, zero or near zero electric fields are created near the holes or depressions. The particle trap allows gravity or the attraction between oppositely charged bodies to actuate charged particles to move into the zero electric field regions and onto the low voltage conductor in the circuit interrupter where the particles discharge any charge thereon. Subsequently, the electric fields in these regions are too low to allow migration of particles to the oppositely charged high voltage electrode.

3,814,880
VACUUM INTERRUPTER CONTACTS HAVING ENERGY DISSIPATION SURFACES

Richard L. Hundstad, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1972, Ser. No. 264,700
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **5 Claims**



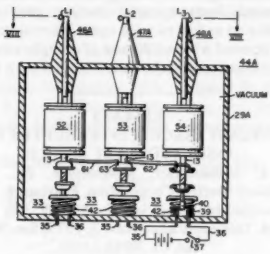
A vacuum type circuit interrupter is provided having separable mating contacts. Multiple arc energy dissipating surfaces are attached to each contact. The arc energy dissipation surfaces are spaced from the contact to which they are attached, and at least a portion of the surfaces extend longitudinal of the vacuum interrupter. The arc is initiated at the primary contact surfaces, adjacent the central point of separable contact structure, and is moved to the arc dissipation surfaces which extend radially and/or axially from the contacts. The arc is rapidly moved to the energy dissipation surfaces and the primary contact surfaces are prevented from becoming eroded.

3,814,881
VACUUM INTERRUPTERS ENCLOSED IN VACUUM HOUSINGS

Sidney J. Cherry, Elmira, and Paul O. Wayland, Montour Falls, both of Ky., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 21, 1972, Ser. No. 273,885
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **5 Claims**

A vacuum-type interrupter is enclosed within a vacuum environment, or housing to enable a better voltage-withstand between the live parts and the outer housing walls. Preferably, the outer housing is formed of metal, and is grounded, with terminal bushings extending through the grounded outer metallic housing. For other applications, however, when desired, the housing may, if desired, be of insulating material.



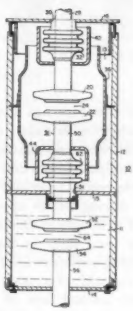
In this latter event, the terminal leads require no conventional-type terminal-bushings for their accommodation.

The operating mechanism may either be disposed externally of the outer housing, or the operating mechanism for the vacuum interrupter may be disposed internally of the outer housing.

3,814,882
HYBRID CIRCUIT INTERRUPTER

Ronald T. Harrold, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 25, 1973, Ser. No. 382,421
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **11 Claims**



A hybrid circuit interrupter is provided, having a set of contacts in a vacuum environment and another set of contacts in an insulating fluid, such as oil, or gas or the like, environment connected in series and disposed in one compact enclosure. During closing the contacts in the insulating liquid or gas are closed after the contacts in the vacuum have closed. During an opening operation the contacts in the vacuum chamber separate first and then the contacts in the chamber containing the insulating fluid or gas separate. Thus, the circuit is completed in the insulating liquid or gas environment and the circuit is opened in the vacuum environment. With the hybrid circuit interrupter fully opened two serially related gaps are provided in the circuit interrupter. One of the contacts in the

chamber containing the insulating fluid or gas is rigidly mechanically connected to one of the contacts in the vacuum chamber. A single operating stroke opens or closes the hybrid circuit interrupter. The contacts used in the vacuum chamber can be constructed from material having low chopping characteristics so that high voltages are not induced in the electrical circuit during interruption. The contacts used in the chamber containing the insulating fluid, such as oil or gas, can be constructed from material having good non-welding characteristics so as not to weld upon interrupter closing and to be easily opened without the use of complicated and expensive weld breaking mechanisms.

3,814,883

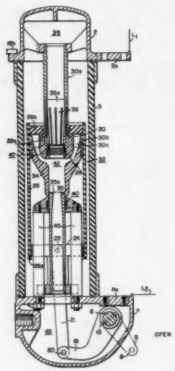
GAS-BLAST CIRCUIT INTERRUPTER WITH INSULATING ARC SHIELD

Stanislaw A. Milianowicz, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 51,709, July 1, 1970, abandoned. This application Nov. 3, 1972, Ser. No. 303,579

Int. Cl. H01h *33/70*

U.S. Cl. 200—148 G **10 Claims**



A gas-blast circuit interrupter has a pair of separable contacts, at least one of which is movable, and a stationary insulating arc shield is disposed immediately adjacent the contacts, and encompasses a critical portion of the initial travel of the cooperable movable contact, so that the space vacated by the movable contact, during initial opening travel, does not communicate with the pressurized space, which contains the interrupting gas to be used later in the interruption of the established arc. Following withdrawal of the movable contact from the insulating arc shield, of at least one inch in length, it is exposed to a radially inward flow of cool gas supplied by suitable piston means, or another high-pressure source, if desired.

3,814,884

CLOSED CHAMBER WITHIN MOVING CONTACT

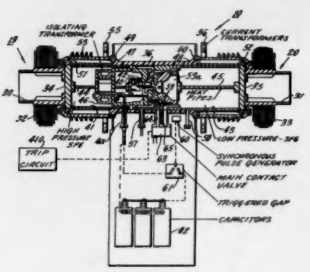
Lorne D. McConnell, Chalfont, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Mar. 14, 1972, Ser. No. 234,578

Int. Cl. H01h *33/82*

U.S. Cl. 200—148 B **12 Claims**

A movable contact for a synchronous circuit breaker has a chamber which has an opening through an orifice contained within the contacting region of the interrupter contact. The interrupter contact is a part of a synchronous circuit breaker system in which blast gas flows through the arc for a relatively short time. The closed chamber in the movable contact permits axial flow of gas in two directions, both into the contact cavity and away from the movable contact, so that gas flow



through the arc is increased. The cavity size is sufficiently large to permit full gas flow capability during the arcing period.

3,814,885

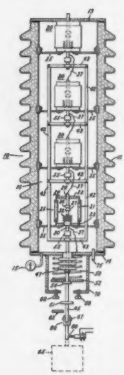
METHOD OF DETECTING A LEAK IN A VACUUM INTERRUPTER LOCATED INSIDE A HOUSING CONTAINING PRESSURIZED GAS

Joseph C. Sofianek, Broomall, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed July 11, 1973, Ser. No. 378,339

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **3 Claims**

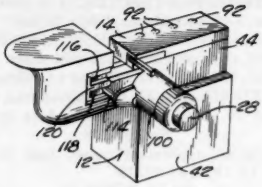


A method is disclosed for detecting a leak in any one of the vacuum interrupters of a vacuum-type circuit breaker that comprises a plurality of vacuum interrupters disposed within a housing filled with pressurized insulating gas. The method comprises: (a) opening the circuit breaker and effectively disconnecting the closing mechanism of the breaker from the operating rod of the breaker so as to effectively preclude the closing mechanism from exerting a closing force on the operating rod, (b) measuring the net force on the operating rod after (a) has been performed, and (c) comparing the measured net force to a standard value corresponding to the force on the operating rod when the interrupters are intact and the insulating gas is at the same pressure as when the net force was measured.

3,814,886
MINIATURE ELECTRICAL REVERSING SWITCH MOUNTED ON TRIGGER OPERATED SWITCH FOR HAND-HELD TOOLS

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 12, 1973, Ser. No. 331,969
Int. Cl. H01h *13/08, 19/36*
U.S. Cl. 200—157 **10 Claims**



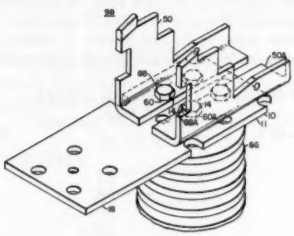
A miniature electrical reversing switch is disclosed for a power tool trigger switch wherein separate pairs of fixed contacts in the switch circuitry are selectively bridged by bridging contactors to reverse current flow therefrom to the tool motor. The contactors are mounted on a movable slide member which is part of a compact one-piece integral plastic molding also including an integral flexible hinge and external knob operator.

The knob operator is mounted concentric with the trigger lock pin bushing and is manually rotated about the base thereof for coaction with the flexing hinge to impart linear sliding action to the slide and bridging contactors relative to the fixed contacts.

3,814,887
MODULAR DISCONNECTING SWITCH

Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1972, Ser. No. 292,243
Int. Cl. H01b *17/16*
U.S. Cl. 200—162 **7 Claims**

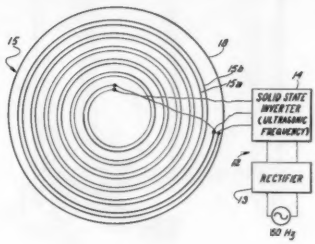


A switch including separate switch portions or parts which may be arranged or assembled in various combinations for outdoor or indoor use. The switch parts include a universal tongue adapted to act as a terminal pad and mounting piece for a switch and a universal jaw piece adapted to be assembled on the terminal pad portion of the tongue in various arrangements or configurations. A hinge piece is adapted to pivotally support a blade which may be moved in and out of engagement with the previously described jaw for providing electrical interconnection between circuits connected thereto. The hinge member may also be disposed on the terminal pad portion of the tongue. Electrical contact pieces may be provided as part of a switch, which include copper rivets the heads of which are encapsulated in tungsten alloy or similar material adapted to make repeated electrical contact operations under load conditions without rapid deterioration. When the contact pieces wear, the rivets may be removed and replaced with similar tungsten alloy encapsulated rivet members. This removes the need for complete disassembly of a switch member in the field and complete replacement of a blade. The previously mentioned jaw and hinge member may be mounted in various combinations or arrangements on separate terminal pads. The terminal pads may then be secured to various commercially available and standard support insulators.

3,814,888
SOLID STATE INDUCTION COOKING APPLIANCE

David L. Bowers, Wauwatosa, Wis.; Donald S. Heidtmann, Louisville, Ky., and John D. Harnden, Jr., Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 19, 1971, Ser. No. 200,526
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.49 **12 Claims**

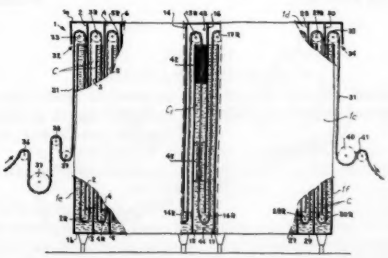


A cooking appliance for inductively heating a cooking utensil comprises a flat induction heating coil mounted beneath a non-metallic support with a substantially unbroken utensil supporting surface. The induction heating coil is driven with an ultrasonic frequency wave generated by a static power conversion circuit typically formed of a rectifier and an inverter. The inverter is a series capacitor commutated sine wave inverter with a variable output frequency, variable input voltage, or variable commutating components to adjust the utensil heating level. The inverter is also controlled in on-off mode by a utensil temperature sensor.

3,814,889
HEAT TREATMENT OF HEAT-SENSITIVE PRODUCTS

Lennart Arvid Stenstrom, Huddinge, Sweden, assignor to Alfa-Laval HB, Tumba, Sweden

Filed Sept. 1, 1971, Ser. No. 176,966
Claims priority, application Sweden, Sept. 8, 1970, 12153/70
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **10 Claims**



Separate units of a heat-sensitive product are each pretreated by heating at least the main part of the unit to a pre-

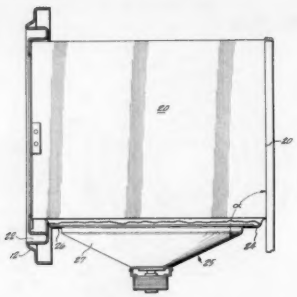
heating temperature of at least 50*LC*., a cooling medium being brought into direct or indirect contact with the unit so that its surface layer is prevented from acquiring a substantially higher pre-heating temperature than its inner parts; and each product unit is then heated to substantially sterilizing or pasteurizing temperature by electro-magnetic energy of at least microwave frequency.

3,814,890

MICROWAVE OVEN HAVING A MAGNETRON EXTENDING DIRECTLY INTO THE OVEN CAVITY

Eldon John Klemp, Mayer, and Vernon Edward Cassibo, New Hope, both of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 16, 1973, Ser. No. 360,763
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **7 Claims**



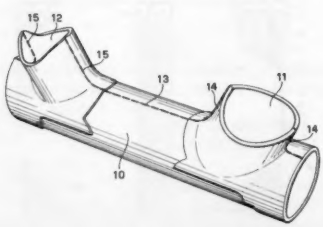
A microwave oven is disclosed which eliminates the need for a wave guide and mechanical stirrer while achieving an even distribution of microwave energy within the oven cavity. The microwave oven comprises a housing having an oven cavity defined by conductively bound surfaces. One of the surfaces, preferably the bottom surface, is of a horn-like structure having diverging surfaces facing the interior of the cavity. An aperture is located at the center portion of the horn-like structure to receive the radiating portion of a magnetron tube to enable the magnetron to feed microwave energy directly into the oven cavity. The outer portion of the diverging surfaces adjoins a cylindrical surface, the radius of the cylinder being a multiple of the wave length of the radiated microwaves.

3,814,891

METHOD FOR THE FORMATION OF CONNECTION SLEEVES

Franco Agrati, Monticello Brianza, Italy, assignor to Agrati-Garelli S.p.A., Monticello Brianza, Italy

Filed Mar. 8, 1973, Ser. No. 339,276
Claims priority, application Italy, Mar. 18, 1972, 22088/72
Int. Cl. B23k *31/06;* **B21d** *39/04*
U.S. Cl. 219—67 **6 Claims**



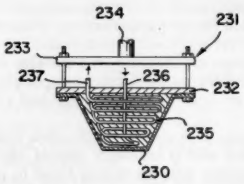
A method and an apparatus are disclosed for manufacturing a sleeve like article, having similar sleeve like branches connected thereto, such as for example portions of a motor-bicycle frame, by resistance welding along a generating line of a stamped out blank. The stamped out blank is properly bent and housed between two clamps which embrace the bent blank for at least two fifths of its overall surface and rest on the surfaces of the branched off sections for at least one fifth of the surface of the latter.

3,814,892

ELECTRODE FOR ELECTRICAL MACHINING

Kiyoshi Inoue, 3-16-8 Kamiyoga, Tokyo, Japan

Continuation-in-part of Ser. No. 723,799, April 24, 1968, Pat. No. 3,591,760, and a continuation-in-part of Ser. No. 508,487, Nov. 18, 1965, Pat. No. 3,512,384, and a continuation-in-part of Ser. Nos. 574,056, Aug. 22, 1966, abandoned, and Ser. No. 64,104, July 29, 1970. This application June 28, 1971, Ser. No. 157,575
Claims priority, application Japan, June 30, 1970, 45-57143; Nov. 11, 1970, 45-99279
Int. Cl. B23k *9/16*
U.S. Cl. 219—69 E **5 Claims**



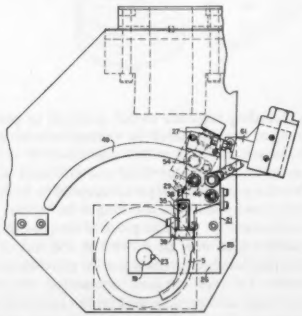
An electrode for the electrical machining of a conductive workpiece by ECM or EDM is produced by high energy rate forming simultaneously with an index formation engaging in an electrode holder whereby a large number of such electrodes can be mass-produced and identically positioned. The electrode defines a space with the holder through which a coolant is circulated to limit thermal deformation in use.

3,814,893

ELECTRODE-FEEDING DEVICE FOR AN ELECTRICAL DISCHARGE MACHINING APPARATUS

James K. Helms, King, N.C., and Robert K. Fischer, Azusa, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 5, 1973, Ser. No. 338,132
Int. Cl. B23k *9/16*
U.S. Cl. 219—69 E **9 Claims**



A reversible servo-motor having a rotatable shaft is mounted on a base plate and an arm is fixed to the shaft to

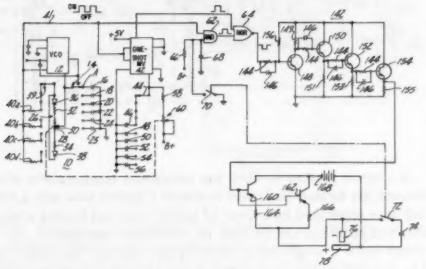
guide an electrical discharge machining electrode along a circular path to form the convex and concave surfaces of two adjacent air foils that make up the nozzles of a nozzle block of a steam turbine.

3,814,894

PULSE GENERATOR AND METHOD FOR ELECTRICAL DISCHARGE MACHINING

Oliver A. Bell, Jr., Mooresville, and Randall C. Gilleland, Statesville, both of N.C., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Mar. 22, 1973, Ser. No. 343,949
Int. Cl. B23k 9/16
U.S. Cl. 219—69 C **18 Claims**



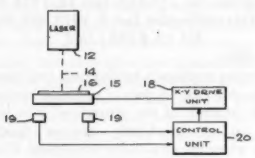
The pulse generator is operable both in the regular machining mode and in the gap capacitor mode. Included in the generator is a first multivibrator for providing a train of machining power pulses of widely variable and controllable ON-OFF time ratio or duty factor. Also included is a second pulse generator operated in phase with the first but providing pulses of a substantially limited duty factor. During finishing operation in the gap capacitor mode, the pulses from the second multivibrator only are gated to provide operation of the electronic output switch and thus the generation of the machining power pulses. Accordingly, the ON-time is operated with an upper limit during the gap capacitor operating mode.

3,814,895

LASER SCRIBER CONTROL SYSTEM

Thorbjoern R. Fredriksen, Palo Alto, Calif., assignor to Electroglas, Inc., Menlo Park, Calif.

Filed Dec. 27, 1971, Ser. No. 212,234
Int. Cl. B23k 27/00
U.S. Cl. 219—121 L **23 Claims**



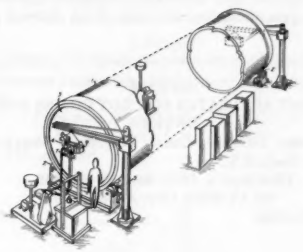
A laser scribe system is disclosed for aligning a wafer on which circuits are deposited, and for controlling the motion of a chuck, supporting the wafer, so that kerfs are cut in the wafer between all the circuits. The chuck is movable along X and Y axes in a XY plane by two indexable stepping motors, with a laser providing a beam in a direction perpendicular to the XY plane. The system is operable in an Align mode in which the chuck is movable back and forth in the X axis and the chuck is rotatable about an axis perpendicular to the XY plane until streets, representing wafer space between circuits, are aligned in the X axis. The system automatically sequences through several scribing phases during which the chuck is moved automatically in the X and Y axes at optimum speed to cut kerfs in all the streets of the wafer.

3,814,896

HOLE CENTER LOCATOR

Albert M. Sciaky, Palos Park, Ill., assignor to Welding Research, Inc., Chicago, Ill.

Continuation of Ser. No. 166,008, July 26, 1971, abandoned.
This application June 12, 1973, Ser. No. 369,264
Int. Cl. B23k 15/00
U.S. Cl. 219—121 EM **5 Claims**



This invention relates to electron beam welding equipment and, more specifically, to a method which is used to determine the center of a circle, for example, the circle which represents the seam between a tube and a plate into which the tube is installed, such as headers in heat exchangers. By the method of this invention the end of the tube and header is scanned by an electron beam of low intensity sequentially along four paths which radiate from a point outwardly and returning along two mutually perpendicular axes. At the point where the beam strikes the edge of the tubing during its outward motion a pulse is generated which, through an electronic system, determines the distance along the path from the starting point of the beam. This information is summed from two opposite directions which lie along a single axis and is used to generate a biasing current for a set of deflection coils which deflect the beam so that its rest position is progressively brought to the center of the circle. This position is retained in a memory system. Means are also provided so that a weld along a circular path at a desired radius in the vicinity of the edge of the tube may be made.

3,814,897

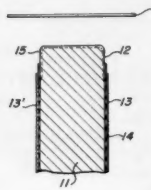
THERMAL PRINTING HEAD

Hiroshi Otani, Shijonawate, and Noboru Yukami, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 29, 1972, Ser. No. 230,332
Claims priority, application Japan, Mar. 4, 1971, 46-11675
Int. Cl. H05b 1/00
U.S. Cl. 219—216 **5 Claims**

A thermal printing head comprising a semiconductor body and a heat-generating resistive layer formed by diffusing an impurity into a surface portion of the semiconductor body by any suitable known method. In the thermal printing head, silicon having a low resistivity is employed to form the semicon-

ductor body and an impurity having a conductivity opposite to that of the semiconductor body is employed to form the heat-generating resistive layer so as to completely concentrate current in the resistive layer and attain remarkable improvements in the heat generating characteristic of the thermal printing head.

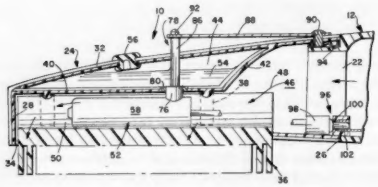


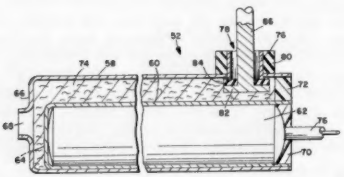
3,814,898

STEAM MIST APPARATUS FOR HOT COMBS AND HAIR DRYERS

Harvey Levine, Fairfield, Conn., assignor to Morris Struhl, Inc., New York, N.Y.

Filed Sept. 6, 1972, Ser. No. 286,836
Int. Cl. H05b 1/00; A45d 24/10
U.S. Cl. 219—362 **5 Claims**





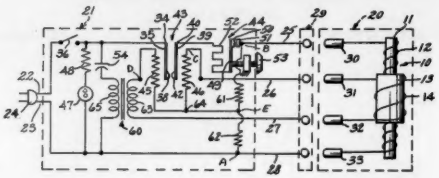
An elongated housing releasably coupled to the hot air outlet end of a handheld hot air blower unit mounts a small steam generator having an electrical heating element energized by the same power supply that energizes the blower unit. The steam generator is located within an air flow passage in the housing which conducts the hot air from the blower unit to a lateral air outlet opening in the housing. The heating element vaporizes water absorbed by a wicking material in contact therewith, the water being admitted to the generator under control of a manually actuated control value form a refillable reservoir cavity formed within the housing. The steam generated is injected into the hot air flowing through the passage prior to discharge thereof through the outlet opening. A comb or brush is inserted in the outlet opening.

3,814,899

OVERTEMPERATURE CONTROL SYSTEM

Walter H. Gordon, Jr., and William D. Ryckman, Jr., both of Asheboro, N.C., assignors to General Electric Company, Bridgeport, Conn.

Continuation-in-part of Ser. No. 316,414, Dec. 18, 1972. This application June 25, 1973, Ser. No. 373,365
Int. Cl. H05b 1/02
U.S. Cl. 219—212 **14 Claims**



A control system to limit the maximum temperature of an electrically heated bedcover in which a heater wire and a control wire separated by a layer of sensor material having a negative temperature coefficient of electrical impedance, all of which form a single cable distributed through the bedcover. The control system includes a series heating circuit including first and second contacts and the heater wire, a series control circuit including first and second actuators and the control wire, and a tie circuit including the layer of sensor material interconnecting the heating and control circuits in parallel with a selected one of the actuators. Phase shifting means is provided for assuring a potential difference between all adjacent portions of the heating and control wires when the heating and control circuits are energized from the same source of a-c power, and the actuators are operatively associated with the contacts such that the contacts are opened so as to cut off the supply of power to the heating wire whenever appreciable conduction occurs through the tie circuit as a result of an elevated operating temperature in the bedcover reducing the impedance of the layer of sensor material.

3,814,900

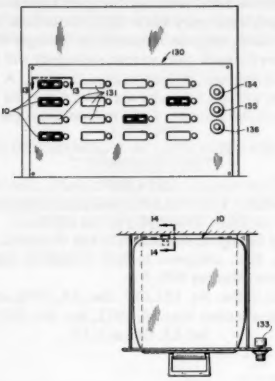
FOOD WARMING SYSTEM WITH SUPPORTING RACK STRUCTURE AND FOOD WARMING APPLIANCES

Irwin K. Frey, P.O. Box 4836, Fairview Park, Ohio 44126, and Charles L. Zola, 24619 Royalton Rd., Columbia Station, Ohio 44028

Division of Ser. No. 273,013, July 18, 1972, Pat. No. 3,746,837. This application Jan. 5, 1973, Ser. No. 321,250
Int. Cl. F27d 11/02
U.S. Cl. 219—385 **6 Claims**

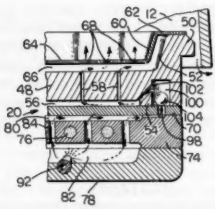
A food warming appliance having base and cover structures defining a portable case. A pair of opposed heating panels are mounted, one in each of the structures, and biased toward each other so as to firmly engage food positioned therebetween when the structures are closed. Foods and food trays of a wide variety of sizes, shapes and thicknesses can be positioned between the panels and firmly gripped so as to be warmed through a gentle conductive heat transfer. The heating compartment is well insulated and has the capability of serving as a cold food storage area to keep frozen foods frozen for substantial periods of time. A safety electrical interlock system normally de-energizes the heating panels when the appliance is open. An interlock by-pass plug and cord permit open case operations where the appliance is to be used to keep foods warm during serving.

A supporting rack structure is provided for receiving and energizing a plurality of such appliances. Selection switches permit selection of one of several predetermined food serving



times. Methods of warming foods for consumption by an individual or large numbers of people through use of such appliances and supporting rack structures are described.

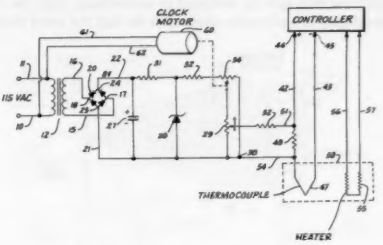
3,814,901
STEAM HEATING DEVICE
George J. Morhack, Natrona Heights, Pa., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.
Filed May 7, 1973, Ser. No. 358,149
Int. Cl. F27d *1/02*
U.S. Cl. 219—401 **12 Claims**



A steam heating device in which a compartment is provided closed on the top by a tiltable cover or lid. A member forming the lower side of the compartment has apertures therein and a steam generating means is provided underneath the member forming the lower side of the compartment for the supply of steam through the apertures thereof into the compartment to heat foodstuffs and the like that are placed in the compartment and enclosed by lowering the lid or cover thereover.

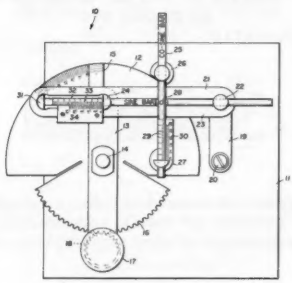
3,814,902
HEAT CONTROL APPARATUS
James D. Fann, 8625 Meadowcroft, Houston, Tex. 77042
Filed May 2, 1972, Ser. No. 249,569
Int. Cl. H05b *1/02*
U.S. Cl. 219—492 **7 Claims**

Heat control apparatus for control of electrical input to an electric heater element to achieve linear temperature rise heating. Time-reduced voltage is applied to a temperature-sensing themocouple (or a thermistor, resistance thermometer, or the like) whereby a controller for heating element is



caused to deliver current to the heating element to linearly increase the temperature of the substance being heated.

3,814,903
AUTOMATIC SINE-COSINE TRIGONOMETER
Joseph Edward Jankowiak, 2910 Culver Rd., Rochester, N.Y. 14622
Filed Aug. 20, 1973, Ser. No. 390,036
Int. Cl. G09b *23/04*; **G06g** *1/00*
U.S. Cl. 235—61 GM **10 Claims**

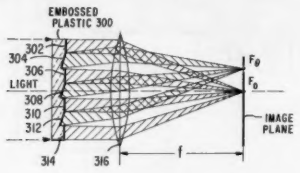


A trigonometer uses a protractor and a pointer arm pivoted to a selected angle on a protractor. An idler arm pivots in parallel with the pointer arm and is joined to the pointer arm by a connector arm. A sine bar is supported in mounts on the pointer arm and idler arm, slidable relative to the sine bar and a cosine bar perpendicular to the sine bar is connected to the sign bar and slidably supported in fixed mounts. A cosine scale indicates the cosine of the angle of the pointer arm as the position of the cosine bar relative to one of its support mounts, and a sine scale indicates the sine of the angle of the pointer arm as the position of one of the sine bar support mounts relative to the sine bar. Hence, the inventive automatic sine-cosine Trigonometer is an instrument for measuring the sine and cosine in thousands of an inch of any angle from 0° to 45° automatically.

3,814,904
CRYPTOGRAPHICALLY CODED CARDS EMPLOYING SYNTHETIC LIGHT MODIFYING PORTION
John Patrick Russell, Thalwil, and David Leslie Greenaway, Bassersdorf, both of Switzerland, assignors to RCA Corporation, New York, N.Y.
Filed Oct. 20, 1972, Ser. No. 299,294
Int. Cl. G06k *7/10, 19/06*; **G08c** *9/06*
U.S. Cl. 235—61.11 E **20 Claims**

A light-modifying portion divided into a plurality of discrete subareas each of which is occupied by an assigned light-modi-

fying form, such as a prism of selected inclination, produces a pattern in accordance with a code of output light beams during decoding which manifests the code. The meridional angle of the form may also be assigned in accordance with the code. Redundancy is optionally obtainable in that the total plurality



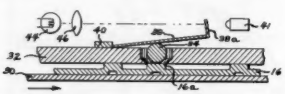
of subareas may be divided into groups of subareas, each member of one particular group possessing the same selected inclination and meridional angle and by using an imaging lens during decoding to focus ones of the output light beams derived from the total plurality of discrete subareas to a common focus point.

3,814,905

EMBOSSED CARD READER

Willis Thompson Lawrence, Winchester, and David B. Spaulding, Carlisle, both of Mass., assignors to Amron Research and Development Corporation, Longmeadow, Mass.

Filed Aug. 22, 1972, Ser. No. 282,723
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11 E **8 Claims**



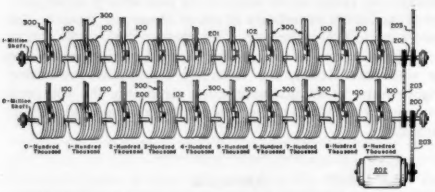
An embossed card reader which utilizes a spring-loaded follower that modified a light beam to a photodetector when the follower encounters an embossed member on the card.

3,814,906

MECHANICAL DATA MEMORY DEVICE HAVING HELICOID DATA CARDS AND PROGRAMMING MEANS THEREFOR

Michael Trotta, 2954 W. 8th St., Brooklyn, N.Y.

Filed Sept. 7, 1972, Ser. No. 287,108
Int. Cl. G06k *17/00, 19/00;* **G11c** *13/00*
U.S. Cl. 235—61.12 R **7 Claims**



A numerical memory device having a card in the form of a helicoid having a number of turns adapted to have indicia marks on the card, where one complete turn of the helicoid represents a predetermined number of units and where a portion of the radius of the card represents a predetermined number of units such that in indicium mark on the card may represent a particular number. The card is mounted on a shaft and means are provided for rotating the shaft a predetermined amount.

Reading means are included to read indicia on the card and to activate an alarm when indicia are read. Programming means are provided with each reading means in order to impart indicia onto the card.

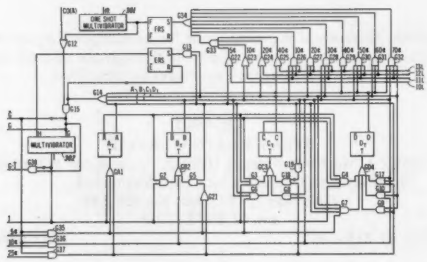
Each helicoid card comprises 100 turns, each turn comprising 1,000 units and the radius of the card represents 10 units such that each card may have 100,000 indicia thereon. A group of 10 cards may be mounted on a single shaft with a reading means for each card so that each shaft will carry cards capable of having one million indicia thereon. A number of shafts may be utilized whereby the device may be adapted to carry indicia in the amount of one million times the number of shafts.

3,814,907

COIN OPERATED TELEPHONE SET EMPLOYING ELECTRONIC TOTALIZER

John Edward Edington, and Merville Lee Warnock, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 101,607, Dec. 28, 1970, abandoned.
This application May 30, 1972, Ser. No. 257,773
Int. Cl. G06m *3/10*
U.S. Cl. 235—92 CN **4 Claims**



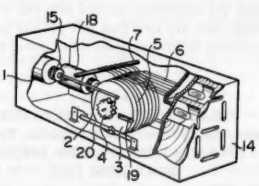
An electronic totalizer for coin operated apparatus combines a plurality of flip-flop logic stages into a ripple counter arrangement that is gated to count-up on coin deposits and to count-down when the coin deposit signal is generated. A variable speed multivibrator controls the coin deposit signals. In a coin telephone embodiment the totalizer is employed in combination with a signal oscillator and additional logic circuitry.

3,814,908

ILLUMINATING FIGURE INDICATING COUNTER

Yasuo Wakabayashi, No. F-191 Kamakura-Zuski, Highland No. 1362-293, Hisaki Machi, Zusk-shi, Kanagawa-ken, Japan

Filed June 27, 1972, Ser. No. 266,676
Int. Cl. G06m *3/06*
U.S. Cl. 235—92 EA **3 Claims**



An illuminated figure indicating, electromagnetic counter is disclosed wherein electrical input pulses are used to drive a

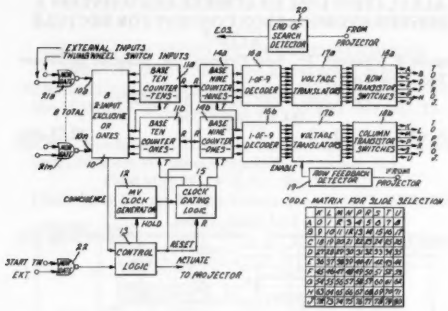
lighted multi-segment numeral indicator. The input pulses are applied to electromagnetic means having an actuating arm which engages a gear affixed to rotor means having a predetermined pattern of surface irregularities. Resilient contacts make and break circuits for each segment of the display responsive to the surface irregularities and the stepwise rotation of the rotor means. A combination of such counters is disclosed enabling multi-digit representations and up and down counting.

3,814,909

ELECTRONIC RANDOM-ACCESS SLIDE PROJECTOR CONTROLLER

Terry L. Hewitt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,595
Int. Cl. G06m 3/02
U.S. Cl. 235—92 MP **11 Claims**



The controller includes multi two-input exclusive-OR gates having first inputs supplied with a two-digit BCD-coded signal representing the desired number of a slide to be selected for viewing in a random-access slide projector. Second inputs to the OR gates are connected to outputs of base 10 "tens" and "ones" counters which count clock pulses in response to a START command signal. Coincidence of the inputs to the OR gates causes a control logic circuit to terminate the generation of the clock pulses which are also counted by two N base (other-than-10) counters. The N base corresponds to the number of rows or columns in a code matrix used to specify the slide numbers. The outputs of the two N base counters are supplied to two one-of-N decoders each of which provides one output signal that identifies the particular row and column in the code matrix which specifies the desired slide location. Interface circuits at the outputs of the decoders provide the proper voltage level of voltage signals applied to the projector mechanism for searching the projector slide tray for the desired slide.

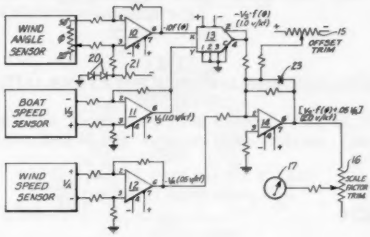
3,814,910

SAILING COMPUTER

Frederick W. Palmieri, Santa Monica, and John S. Pettingell, Huntington Beach, both of Calif., assignors to Computer Equipment Corp., Santa Ana, Calif.

Filed Aug. 2, 1972, Ser. No. 277,363
Int. Cl. G06j 7/78
U.S. Cl. 235—150.2 **6 Claims**

A computer and a method for sailing a boat to windward to obtain maximum velocity made good. A solution algorithm permitting linear relations and a single multiplier in computing



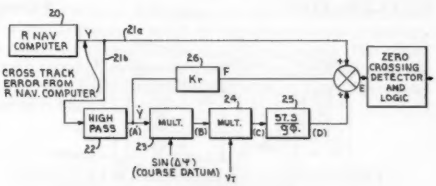
velocity made good, with apparent wind speed and angle and boat speed as the data sources.

3,814,911

METHOD AND APPARATUS FOR INTERCEPTING A RADIO DEFINED COURSE

James J. Lehfeldt, Olathe, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Dec. 26, 1972, Ser. No. 318,105
Int. Cl. G06g 7/78
U.S. Cl. 235—150.26 **10 Claims**



A method and apparatus for computing a maneuver initiating logic signal including suitable circuitry and steps to produce a crosstrack rate signal is modified by a course datum variable and a conversion factor which will include a constant maximum bank angle. Further, this electrical signal is modified by the actual variable velocity of the aircraft and a comparing means is provided to compare a final velocity modified signal with a signal corresponding to crosstrack distance. When zero crossings are detected, the resultant logic signal indicates that the maneuver bank turn should be initiated for proper intercept and a capture of a radio course.

3,814,912

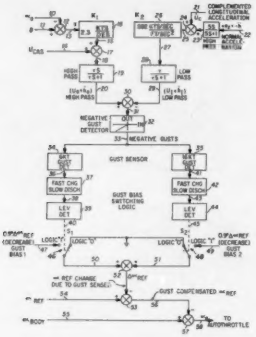
GUST COMPENSATION FOR ANGLE-OF-ATTACK REFERENCE AIRCRAFT SPEED CONTROL SYSTEM

Girard M. Manke, Los Angeles; Theodore J. Schuldt, Jr., Thousand Oaks, both of Calif., and James A. Klein, Dayton, Ohio, assignors to Collins Radio Company, Dallas, Tex.

Filed Jan. 4, 1973, Ser. No. 321,100
Int. Cl. B64c 13/16; G06g 7/70
U.S. Cl. 235—150.2 **8 Claims**

A system for deriving signals proportional to horizontal and vertical wind gust level each as the difference between an atmospheric measurement and an inertial reference and, by a

threshold sensitive signal translator responsive only to negative ones of the derived signals, to subtract gust bias signals



from the system angle-of-attack reference to compensate for those gust components which tend to reduce lift.

3,814,913
PROCESS CONTROL APPARATUS

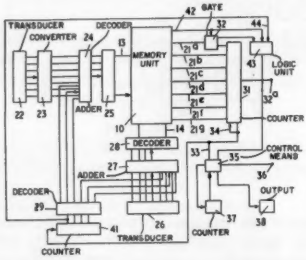
John Michael Ironside, Birmingham; Duncan Barry Hodgson, Leamington Spa; Michael Murray Bertioli, Lichfield, and Malcolm Williams, Solihull, all of England, assignors to Joseph Lucas (Electrical) Limited, Birmingham, England

Filed Dec. 13, 1972, Ser. No. 314,786

Claims priority, application Great Britain, Dec. 21, 1971, 59506/71

Int. Cl. G06f *15/46*

U.S. Cl. 235—151.1 **9 Claims**



"PROCESS CONTROL APPARATUS" includes two transducers for measuring two parameters of the process, and a memory unit to which the outputs from the transducers are fed. The memory unit produces an output dependent on the values of the two parameters, this output being binary, and being coupled to a counter which also receives clock pulses. The counter samples the memory unit output, and produces an output pulse when the clock pulse reading is equal to the sample reading. The output pulses are then used to control the process.

3,814,914
AUTOMATIC DRY COKE WEIGHT SYSTEM

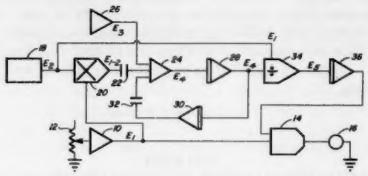
Harold A. List, and Jack H. Baker, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed June 5, 1973, Ser. No. 367,264

Int. Cl. G06g *7/66*; G01g *13/02*, *13/28*

U.S. Cl. 235—151.1 **2 Claims**

An analog electrical system utilizes a signal from a coke weighing system and a signal from a coke moisture gauge to correct for prior errors in hopper weighings due to delivery



overshoot as well as moisture variations in prior batches of coke.

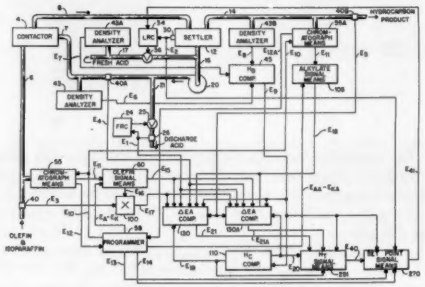
3,814,915
MEANS AND METHOD FOR CONTROLLING ALKYLATION UNIT TO ACHIEVE AND MAINTAIN A DESIRED HYDROCARBON CONTENT FOR RECYCLE ACID

Donald E. Sweeney, Jr., New Orleans, La., assignor to Texaco Inc., New York, N.Y.

Filed Jan. 17, 1973, Ser. No. 324,261

Int. Cl. G06g *7/58*

U.S. Cl. 235—151.12 **22 Claims**



The existing hydrocarbon content in the recycle acid in an alkylation unit is determined. Changes in earnings associated with increasing and decreasing the hydrocarbon content conditions are also determined. The interface level separating the acid phase and the hydrocarbon phase in an acid settler in the alkylation unit is controlled in accordance with the determinations to achieve and maintain a desired hydrocarbon content for the recycle acid.

3,814,916
MEANS AND METHOD FOR CONTROLLING AN ALKYLATION UNIT TO ACHIEVE A DESIRED FEED ISOBUTANE FLOW RATE

Donald E. Sweeney, Jr., New Orleans, La., assignor to Texaco Inc., New York, N.Y.

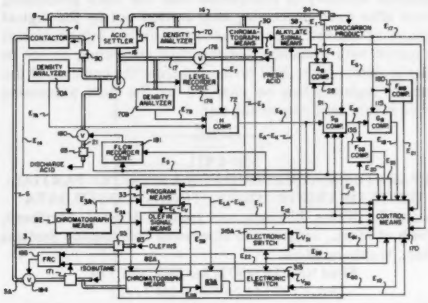
Filed Mar. 19, 1973, Ser. No. 342,650

Int. Cl. G06g *7/58*

U.S. Cl. 235—151.12 **23 Claims**

A control system and method controls an alkylation unit in a manner to achieve a desired feed isobutane flow rate. Trial

isobutane flow rates and their effects are calculated. The trial isobutane flow rate, along with its corresponding discharge

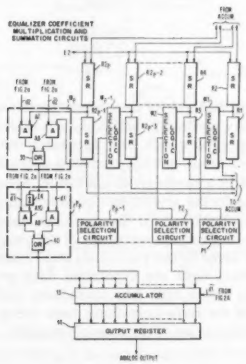


acid flow rate, that obtains a desired effect is then imposed on the feed isobutane and discharge acid, respectively.

3,814,917
SIGNAL PROCESSING DEVICE FOR WEIGHTING DELTA CODED SEQUENCES BY PAIR WISE SUMMATION OF COEFFICIENTS ACCORDING TO THE MATCHING CONDITION OF COUNTERPART DELTA DIGITS

Henri J. Nussbaumer, Lagaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1973, Ser. No. 364,843
Claims priority, application France, June 1, 1972, 72.20510
Int. Cl. G06f 7/38
U.S. Cl. 235—152 **2 Claims**

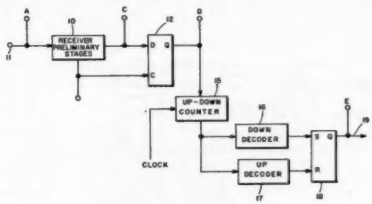


An input analog signal is sampled and then Δ coded. The resulting Δ bits $x(t-\tau)$, $x(t-2\tau)$, $x(t-3\tau)-x(t-2N\tau)$ are recirculated through a shift register at a frequency N times higher than the sampling frequency. The high cycling rate makes it possible to automatically multiplex the coefficient weighting of the Δ coded bits coming from the shift register. The multiplexing operation is carried out in such a manner such that at each shift instant, two Δ bits are available in parallel. The weighting coefficients C_1, C_2, C_3–C_{2N} are processed pair wise in the form of sums and differences $(\pm C_1 \pm C_2)$; $(\pm C_3 \pm C_4)$ of the coefficients, the sum or difference being formed according as to whether the counterpart pair of Δ bits matched or mismatched (00, 01, 10, 11) i.e., $x(t-\tau) > x(t-2\tau)$, $x(t-\tau) < x(t-2\tau)$ or $x(t-\tau) = x(t-2\tau) = [_0{}^1$. The relative values of two Δ coded bits coming from the shift register at a given instant control the selection of binary characters available in the parallel form and being representative either of the sum of the cwo corresponding coefficients or the different thereof, or the value opposite to the sum or the value opposite to the difference. These binary characters are successively accumulated in the accumulator, the output of which supplies a differential PCM-coded sample of the filtered signal, upon each period of the sampling frequency.

3,814,918
DIGITAL FILTER FOR A DIGITAL DEMODULATION RECEIVER

Harold Garth Nash, Tempe, and Michael Frederick Wiles, Phoenix, both of Ariz., assignors to Motorola Inc., Chicago, Ill.

Filed June 28, 1973, Ser. No. 374,613
Int. Cl. H04b 1/16
U.S. Cl. 235—152 **7 Claims**



A digital filter comprising an up-down counter conditioned by a signal indicative of whether an input periodic oscillation signal is of a frequency representing a binary 1 or a binary 0, to count in one direction to a threshold count for an input 1, and to count in the other direction to a threshold count for an input 0 is disclosed. Additional, a crystal controlled oscillator provides the pulses by which the up-down counter counts in a direction determined by the conditioning signal. The conditioning signal is provided by a storage flip-flop which is conditioned by an indicia signal flip-flop from the digital demodulation receiver.

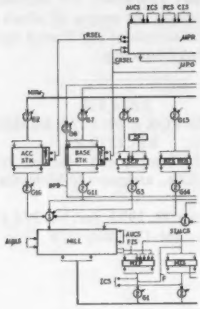
3,814,919
FAULT DETECTION AND ISOLATION IN A DATA PROCESSING SYSTEM

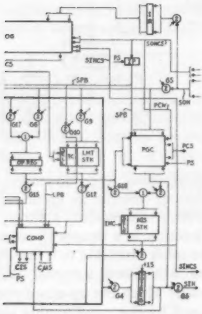
Charles Samuel Repton, Wooburn Green; Peter Charles Venton, and Kenneth James Hamer Hodges, both of Wimborne, Dorset, all of England, assignors to Plessey Handel und Investment A.G., Zug, Switzerland

Filed Mar. 1, 1972, Ser. No. 232,463
Claims priority, application Great Britain, Mar. 4, 1971, 5994/71
Int. Cl. G06f 11/04
U.S. Cl. 235—153 AK **7 Claims**

A fault interrupt system is arranged, upon the detection of a fault to cause a processor in which the fault is detected to enter a fault check-out routine. Successive fault conditions detected while performing the fault check-out routine causes reentry into that routine. A faulty processor is therefore, trapped within the fault check-out routine. Additionally the detection of a fault causes the master capability register of the fault detecting processor to be overwritten with a capability defining a special capability table which is only relevant to the fault check-out programs. By this mechanism the faulty processor cannot, even under fault conditions, gain access to any storage areas outside those of the fault check-out programmes. In the multi-processor/multi-storage module system of the PP250 a number of copies of the fault check-out programs and related workspace areas on a one copy per store module basis are provided together with a special capability pointer for each processor of the system and each entry into the check-out programme is performed using a different store

and therefore entry mechanism into the check-out programmes copy so that intermittent processor faults or particu-





lar storage module faults will not maintain the processor indefinitely in the check-out program.

3,814,920

EMPLOYING VARIABLE CLOCK RATE

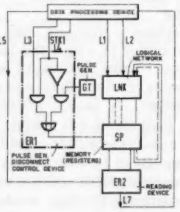
Hubert Huelters, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 15, 1972, Ser. No. 226,469

Claims priority, application Germany, Mar. 10, 1971, 2111493

Int. Cl. G06f *11/04*

U.S. Cl. 235—153 AC **5 Claims**



A method and apparatus for fault diagnosis in pulse controlled devices whose control contains a logical network and a memory composed of a plurality of registers through the utilization of a data processing device wherein test apparatus is connected to the data processing device, the tested device internal timing pulse is switched off and replaced by a processing pulse supplied by the data processing device to form the basis on which the logical network of the test apparatus carries out a processing step, the contents of the test apparatus memory is transferred into the data processing device after each processing step carried out by the logical network of the test apparatus, the transferred information is compared with a standard in the data processing device in order to detect faults, and further wherein the contents of the memory registers can be changed by the data processing device before each processing step.

3,814,921

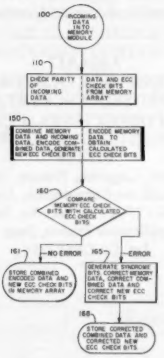
APPARATUS AND METHOD FOR A MEMORY PARTIAL-WRITE OF ERROR CORRECTING ENCODED DATA

Chester M. Nibby, Billerica, and John C. Manton, Marlboro, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 15, 1972, Ser. No. 306,779

Int. Cl. G11c *29/00*; G06f *11/12*

U.S. Cl. 235—153 AM **7 Claims**


100
INCOMING DATA TO BE WRITTEN INTO MEMORY MODULE
110
CHECK PARITY OF INCOMING DATA
DATA AND ECC CHECK BITS FROM MEMORY ARRAY
150
COMBINE MEMORY DATA AND INCOMING DATA, ENCODE COMBINED DATA, GENERATE NEW ECC CHECK BITS
ENCODE MEMORY DATA TO OBTAIN CALCULATED ECC CHECK BITS
160
COMPARE MEMORY ECC CHECK BITS WITH CALCULATED ECC CHECK BITS
161
NO ERROR
165
ERROR
STORE COMBINED ENCODED DATA AND NEW ECC CHECK BITS IN MEMORY ARRAY
GENERATE SYNDROME WITH MEMORY DATA, CORRECT COMBINED DATA AND CORRECT NEW ECC CHECK BITS
168
STORE CORRECTED COMBINED DATA AND CORRECTED NEW ECC CHECK BITS

Apparatus and method for improved "partial-write" operation in a memory module in which data is stored along with error-correcting code check bits. Incoming data replaces a portion of a data group already stored in a specified memory module location in a partial write operation. Apparatus is provided according to the invention, for determining the error-correcting code check bits for the combined data group while simultaneously verifying the accuracy of the previously stored data group. An error in the previously stored data causes apparatus to correct both the combined data group and the error-correcting check bits. The correction, rather than the recalculation, of the error-correcting code check bits permits more effective utilization of the memory module.

3,814,922

AVAILABILITY AND DIAGNOSTIC APPARATUS FOR MEMORY MODULES

Chester M. Nibby, Billerica; John C. Manton, Marlboro; Benjamin S. Franklin, Boston, and John L. Curley, Sudbury, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

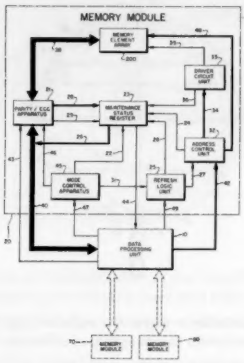
Filed Dec. 1, 1972, Ser. No. 311,074

Int. Cl. G06f *11/04*

U.S. Cl. 235—153 AK **23 Claims**

In a semiconductor memory module associated with a data processing unit, a maintenance status register and associated apparatus identity and store information relating to erros arising in the memory module. The stored information is transferred from the maintenance status register, upon receipt of a proper command signal, to the data processing unit for diagnostic and availability analysis. A mode of operation of the

maintenance status register is provided for checking logic circuits associated with the refresh apparatus of the semiconductor memory elements under control of the data processing



unit. Information concerning errors in data entering the memory module is also available to the maintenance status register and associated equipment.

3,814,923

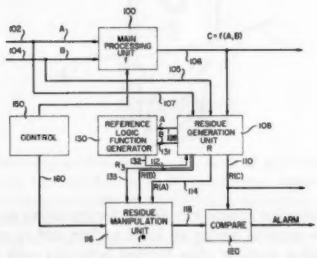
ERROR DETECTION SYSTEM

Tse Lin Wang, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1973, Ser. No. 320,461

Int. Cl. G06f *11/10*

U.S. Cl. 235—153 BD **4 Claims**



The present invention includes circuitry for generating signals corresponding to the predicted residues of logic operations performed in the arithmetic logic unit of a digital processor. In addition, circuitry for generating signals corresponding to the actual residue of the result of a logic operation performed in the arithmetic logic unit and means for comparing the predicted and actual residue signals are provided thereby to check the accuracy of the logic calculations performed in the arithmetic logic unit.

3,814,924

PIPELINE BINARY MULTIPLIER

Donald P. Tate, St. Paul, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

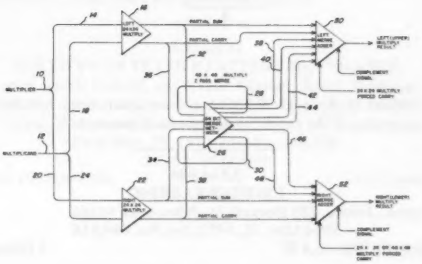
Filed Mar. 12, 1973, Ser. No. 340,633

Int. Cl. G06f *7/54*

U.S. Cl. 235—164 **3 Claims**

A high speed pipeline multiplier system for a digital computer operates on a continuous stream of operands each having a given number of bits or on a stream of paired operands each operand having one-half the given number of bits. The multiplier system has two sections with a common merge network and if two streams of independent operands are being multiplied, the multiplier system produces independent results.

In either mode of operation, the multiplier operands are divided into a plurality of groups, each group of which is assigned a certain translation value by a decode network. The multiplicand is supplied to the multiplier system during the decoding operation. The translation value assigned to each group of the multiplier operand represents an instruction to gate the multiplicand to a summation device in a certain way. The summation device thus receives a number of partial products equal to the number of groups in the multiplier. This in effect completes the multiplication and the summation device produces the final product by summing the various gated values of the multiplicand. A partial adder tree may be used as the summation device.



When the multiplier system is operating on single operands, the individual operands are split in half and treated as if each half was independent. However, each of the multiplier sections must perform two multiplications with each half operand in order to completely define the product of the regular width operands. That is, the lower half of the full width multiplier must operate on both the upper half and lower half of the full width multiplicand just as the upper half of the full width multiplier must operate on both the upper half and lower half of the full width multiplicand. After these partial products are entered into the summation device, an early carry means is provided so that if a carry is to occur from the lower half of the final full width product to the upper half of the final full width product, this will be recognized in time for the entire final product to be produced at one time with a simultaneous formation of the lower half of the final product and the upper half of the final product with the carry already added.

3,814,925

DUAL OUTPUT ADDER AND METHOD OF ADDITION FOR CONCURRENTLY FORMING THE DIFFERENCES A—B AND B—A

Ulrich Spannagel, Los Altos, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

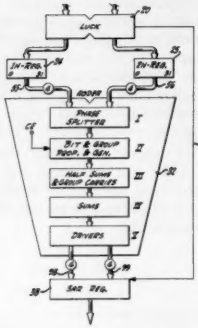
Filed Oct. 30, 1972, Ser. No. 302,225

Int. Cl. G06f *7/50*

U.S. Cl. 235—175 **11 Claims**

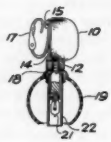
Disclosed is an adder and a method of addition for use in a data processing system. The adder concurrently produces from operands A and B dual outputs which are the difference A—B and the difference B—A. The dual outputs from the adder are used in exponent arithmetic where the smaller operand is subtracted from the larger operand. At the time the subtraction commences it is not known which operand, A or

B, is larger and therefore whether A−B or B−A is desired. The dual output adder insures that the desired subtraction, either



A−B or B−A, is available at a time which does not delay processing of the exponent arithmetic instruction.

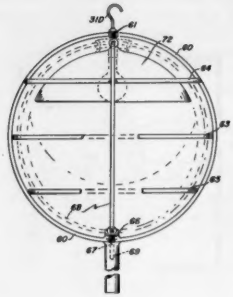
3,814,926
LIGHTED EARRING
Ann C. Frasca, 458 Hogarth St., Niles, Ohio 44446
Filed Mar. 31, 1972, Ser. No. 240,016
U.S. Cl. 240—6.4 W **4 Claims**



A lighted earring includes a hollow body and a spaced clamp mechanism for attaching the same to an ear lobe of a person wearing the earring. A bracket including a socket is supported on the hollow body in depending relation thereto and an insulated conductor extends from a point adjacent the socket to a point within the hollow body for engagement with a terminal on a battery positioned in the hollow body. The socket has a filigreed ornamental shade suspended therefrom and is adapted to receive a bulb extension member and an incandescent light bulb therein. Optional transparent colored sleeves are provided for altering the color of the lighted earring.

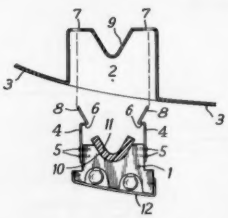
3,814,927
DROP LIGHT
Thomas Buzza, 1935 Rt. 23, Wayne, N.J. 07470
Continuation-in-part of Ser. No. 10,562, Feb. 11, 1970, abandoned. This application Jan. 8, 1971, Ser. No. 104,956
Int. Cl. F21l *1/00*; F21v *21/00*
U.S. Cl. 240—54 A **2 Claims**

A drop light with an extension cord having a protective shield or cage about the lamp and a hanging support or clamp. Said protective shield and cage may be provided with heat dissipating means to prevent accidental burns. Said protective shield may be a half-round or half-sphere shaped reflector that



is rotatably adjustable to direct the reflected light in a desired direction, and maintain the direction of reflected light.

3,814,928
DEVICE FOR MOUNTING AN ELEMENT ON A SUPPORT
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Continuation-in-part of Ser. No. 45,612, June 12, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,754
Claims priority, application France, Mar. 16, 1972, 72.09256; June 13, 1969, 69.19837
Int. Cl. F21v *21/00*; B60g *1/00*
U.S. Cl. 240—57 **5 Claims**

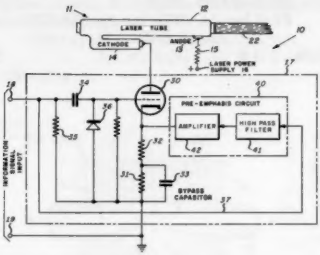


This invention relates to a device for mounting an element on a body support having an inner surface and an outer surface utilizing resilient clips formed integrally with said element, the clips adaptable to be inserted from the outside of the outer surface of the support into apertures formed in the support, the clips each provided with projections for locking the element on the support with the free ends of the clips being solely accessible from the inner surface of the support after the element is mounted. The invention also relates to a vehicle employing this device wherein the element is comprised of an optical unit and is mounted in a cavity or recess formed in the bodywork of the vehicle to receive the unit, and the bodywork provides the support for the optical unit.

3,814,929
LASER DATA TRANSMITTER WITH WIDE FREQUENCY BANDWIDTH
Edwin W. Whitfield, Great Neck, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 5, 1972, Ser. No. 250,782
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 **5 Claims**

A laser data transmitter comprises a laser and a modulator coupled therewith for modulating the laser energizing current

in accordance with the data. The modulator includes high frequency pre-emphasis circuitry for compensating the high



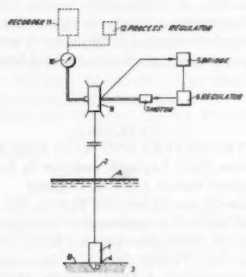
frequency roll-off characteristics of the laser thereby providing a wide frequency bandwidth laser data transmitter.

3,814,930

DETERMINING AND FOLLOWING A SEDIMENTATION LEVEL BY OPTICAL MEASUREMENT

Arne Robert Lindberg, Slingergatan 18, 431 39 Molndal, Sweden

Filed Nov. 5, 1970, Ser. No. 87,077
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **6 Claims**



The present invention relates to a method and a device for determining the location of a predetermined sedimentation content at various depths in liquid media present in sedimentation pools, dams and the like. According to the invention the actual value of various sedimentation levels in said liquid is continuously compared with a predetermined desired value set on a regulator, whereby the measuring device during the entire measuring process automatically seeks and follows the depth in the medium corresponding to the predetermined value so that the immersion depth of the device indicates the level at which the predetermined content is present.

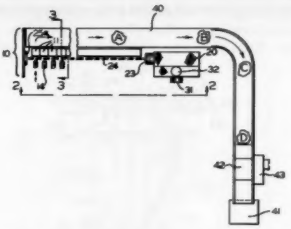
3,814,931

INSPECTION APPARATUS AND MEANS

Toyoaki Kuroda, Troy, Mich., and Toyokazu Shimizu, Sagamihara, Japan, assignors to Parke, Davis & Company, Detroit, Mich.

Filed May 22, 1972, Ser. No. 255,766
Int. Cl. H01j *39/12*
U.S. Cl. 250—223 R **6 Claims**

Apparatus and means are provided for the quality control of hard shell pharmaceutical capsules comprising a set of collets or holders arranged side-by-side in a row for supporting and moving successive sets of individual capsule shells open-end foremost in timed relation from a work station, photosensor means for scanning a light beam projected across the path of the conveyed capsule parts, control means for activating the scanning mode during a predetermined time segment in the motion cycle such that during the time segment the light beam bypasses the leading edge of advancing standard-length cap



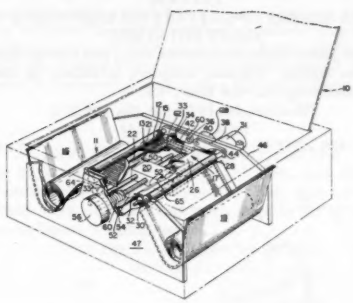
sule parts but is blocked and prevented from being scanned by the intervention of any over-length capsule parts, and means responsive to the scanning means for signalling and/or rejecting capsule parts thus found blocking the beam.

3,814,932

MULTICOLOR TEXTILE PATTERN TRANSLATOR

Reuven Anati, Rehovit, and Avner Adoram, Ramat Hasharon, both of Israel, assignors to Scientific Technology Limited, Kiryat, Weizmann, Rohorat, Israel

Filed Mar. 29, 1972, Ser. No. 239,200
Int. Cl. G01j *3/34*
U.S. Cl. 250—226 **11 Claims**



A multicolor textile pattern translator has a scanner arranged to scan a color pattern. The scanner includes a light source for directing light toward the pattern and a plurality of light sensors arranged to receive light reflected from the pattern. Each light sensor is responsive to a different, very narrow, nonoverlapping spectral band of the reflected light, and each sensor produces an electrical signal in response to reflected light within its corresponding spectral band. The chosen colors are such that they can produce two magnitude levels of light reflection, one level is called high and one called low and the reflection combination of high and low levels for each sensor is different.

3,814,933

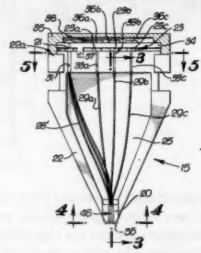
OPTICAL TRANSDUCER HAVING RECTILINEAR FIBER OPTIC ARRAY INCLUDING INTERDIGITATED LIGHT SOURCE AND SENSOR ASSOCIATED FIBERS

Otto K. Weber, Van Nuys, Calif., assignor to Sensor Technology, Inc., Chatsworth, Calif.

Filed Apr. 5, 1973, Ser. No. 348,197
Int. Cl. G02b *5/16*
U.S. Cl. 250—227 **11 Claims**

A fiber optic transducer includes at least one read aperture at which optical fibers conducting light from a source and

fibers transmitting reflected light to a sensor terminate in rectilinear array. The optical fibers all are of rectangular cross-section and are arranged in the array so that each row of reflected light transmitting fibers is interdigitated between rows of light source conducting fibers. The other ends of the light source fibers from all of the read apertures terminate in a



single source aperture illuminated by a light emitting diode or other light source. The reflected light transmitting fibers from each read aperture terminate at respective separate sensor apertures. The transducer is used to read optically coded indicia on a tag, label or other article which is moved past the transducer in close proximity to the read apertures in a direction parallel to the interdigital rows of fibers.

3,814,934

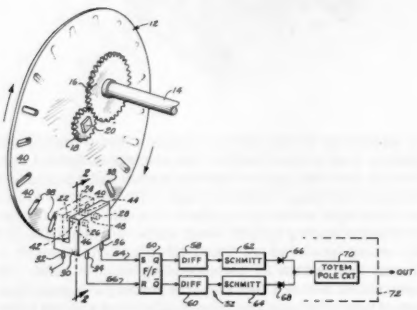
PULSE GENERATING APPARATUS RESPONSIVE TO SHAFT ROTATION

Theodore Julius Mesh, Greensboro, N.C., and George Thomas Devine, Hutton, England, assignors to Gilbert & Barker Manufacturing Co., New York, N.Y.

Filed Nov. 10, 1972, Ser. No. 305,274

Int. Cl. G01d *5/34*

U.S. Cl. 250—231 SE **7 Claims**



An embodiment of the pulse generating apparatus which is disclosed includes an optical encoder and accompanying electrical circuitry designed to prevent operational vibration and backlash from causing the generation of false pulses. The encoder includes a pair of light sources spaced from and aligned with a pair of light detectors. The space between these devices is intercepted by a rotating slotted disc. A flip-flop is connected to the outputs of the detectors so that it is first set and then reset by the light pulse which passes to each detector in response to the passage of each slot in the disc. A minimum hysteresis, namely 2°, is incorporated into the design of the pulse generating apparatus to insure against undesired setting or resetting of the flip-flop by backlash or vibration.

3,814,935

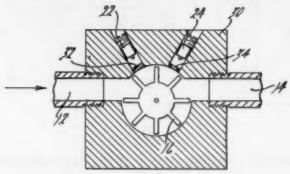
PHOTO-OPTICAL TRANSDUCER

William R. Kissel, Taylor, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 24, 1973, Ser. No. 326,330

Int. Cl. G01d *5/34*

U.S. Cl. 250—231 R **5 Claims**



A photo-optical transducer has a light emitting device energizable from a source of electrical potential through a current controlling element whose impedance is varied by a light activated device regeneratively connected with the current controlling element to vary the current drawn by the transducer between a pair of predetermined levels. The luminous output of the light emitting device is modulated by a condition responsive member, as a flowmeter paddle wheel, which is located in the light path between the light emitting device and the light activated device and is displaced in accordance with a parameter of a physical condition, as fluid flow, being monitored thereby.

3,814,936

MASS SPECTROMETERS AND MASS SPECTROMETRY

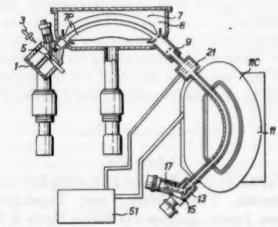
Brian Noel Green, Sale, England, assignor to Associated Electrical Industries Limited, London, England

Continuation-in-part of Ser. No. 81,173, Oct. 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 767,565, Sept. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 571,049, June 8, 1966, abandoned. This application Oct. 4, 1971, Ser. No. 186,250

Claims priority, application Great Britain, Aug. 12, 1965, 34603/65

Int. Cl. H01j *39/34*

U.S. Cl. 250—295 **5 Claims**

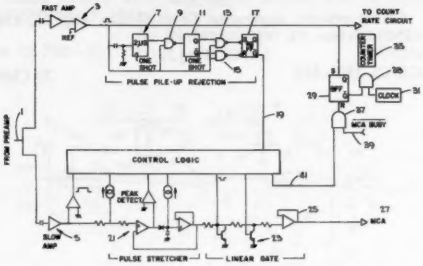


In a mass spectrometer having a magnetic analyzer, auxiliary ion beam control means comprising electrode structures which behave as electrostatic lenses are located externally of the magnetic analyzer to adjust the focal length of the ion beam to compensate for irregularities in the magnetic field of the magnetic analyzer caused by eddy currents induced in the analyzer during high speed scanning.

3,814,937
PULSE PILE-UP REJECTOR WITH LIVE-TIME CORRECTOR CIRCUIT

Albert Robert Lowes, Burlingame, Calif., assignor to Kevex Corporation, Burlingame, Calif.

Filed Apr. 24, 1972, Ser. No. 246,819
Int. Cl. G01t 1/00
U.S. Cl. 250—336 **2 Claims**

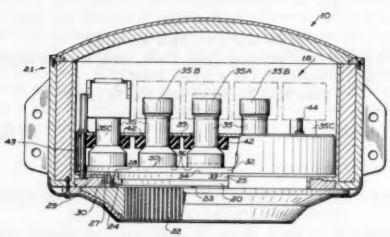


A live-time corrector circuit is provided in an x-ray counting device wherein the dead time of the analyzer device as well as dead time caused by overlapping events are compensated for by extending the counting time.

3,814,938
SCINTILLATION CAMERA WITH IMPROVED LIGHT DIFFUSION

Ronald J. Martone, Cheshire; Samuel C. Goldman, Bethany, and Walter Wolczek, Trumbull, all of Conn., assignors to Picker Corporation, Cleveland, Ohio

Filed July 10, 1972, Ser. No. 270,006
Int. Cl. G01t 1/20
U.S. Cl. 250—366 **31 Claims**



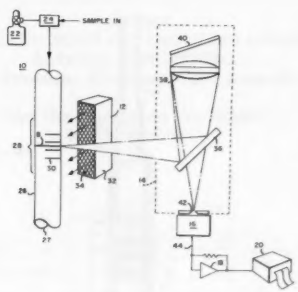
A scintillation camera of the multiple phototube type. A thin light pipe and masks are employed to diffuse the light so that the camera operates on a principle of light diffusion rather than phototube "viewing" as described in the prior art. The configurations of the masks are selected in accordance with the characteristics of the crystal and associated phototubes.

3,814,939
CHROMATO-FLUOROGRAPHIC DRUG DETECTOR

John A. Parker, Los Altos; John Dimeff, San Jose, and Alvin H. Heimbuch, El Cerrito, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 25, 1973, Ser. No. 354,611
Int. Cl. G01t 1/00
U.S. Cl. 250—373 **10 Claims**

A drug detecting apparatus including a chromatographic system for separating a particular substance from a sample solution passed therethrough, a source of radiation for irradiating the separated substance as it moves through the chromatographic system and for causing it to fluoresce and emit fluorescent radiation, an optical system for spectrally separating the fluorescent radiation according to wavelength and for focusing particular portions of the separated spectrum through an exit aperture, a photodetector responsive to radiation passing through the exit aperture and operative to develop an electrical signal commensurate with the intensity of such radiation, and a recorder responsive to the electrical signal and operative to provide an indication of certain characteristics of the substance.

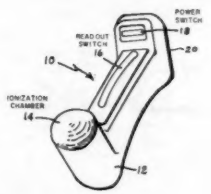


The invention described herein was made by employees of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

3,814,940
PORTABLE HAND HELD DOSIMETER

Glenn C. Ainsworth, Albuquerque, N. Mex., and Marion F. Schneider, Palos Verdes Peninsula, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 25, 1972, Ser. No. 275,022
Int. Cl. G01t 1/02
U.S. Cl. 250—389 **2 Claims**



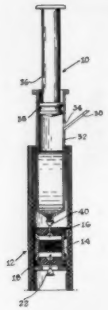
A portable light weight hand held dosimeter for measuring both dose rate and total dose received. Dose rate is sensed then amplified by a logarithmic electrometer, the signal is processed through a differential amplifier and provides a reading on a calibrated voltmeter. Total dose is sensed and generates a voltage to charge a capacitor, which activates a field effect transistor network, the output is amplified in a compound transistor amplifier which drives a mechanical register.

3,814,941

LOADING SYRINGE FOR USE WITH RADIOACTIVE SOLUTIONS AND OTHER NON-STERILE SOLUTIONS

Thomas V. Czaplinski, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 24, 1972, Ser. No. 300,093
Int. Cl. A61f 5/46; G21h 5/00
U.S. Cl. 250—430 1 Claim



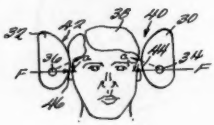
A loading syringe for use with radioactive solutions. A hollow syringe body is opened at its upper end and has a hypodermic needle at its lower end. A loading pouch is formed in the wall of the syringe body out of the path of travel of a plunger. The filling pouch is integral with the syringe body and opened to the interior thereof. With the plunger in place at the top of the body, radioactive solution is delivered to the interior of the body via the filling pouch. The solution is then injected into a radioactive material generator by way of the hypodermic needle.

3,814,942

HUMAN HEAD RESTRAINT SYSTEM

Stephen C. Darden, Reston, Va., assignor to Acuity Systems, Incorporated, McLean, Va.

Filed Nov. 10, 1972, Ser. No. 305,330
Int. Cl. G01n 21/00
U.S. Cl. 250—456 4 Claims



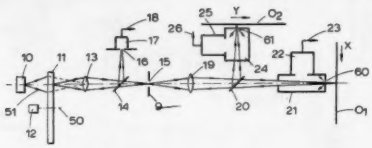
A human head restraint system for positively restraining the human head in a predetermined position utilizing eccentrically pivoted cams on either side of the predetermined position for engaging various sizes of human heads. The active area of the cam profiles are non-circularly shaped for insuring that the area of actual contact with most human head sizes is close to a line passing through the cam pivot points thus minimizing the effective lever arm available to the restrained head for effecting movement of the restraining cams from the predetermined position.

3,814,943

METHOD OF AND APPARATUS FOR ANALYSING PATTERNS AND INSPECTING OBJECTS

Lionel Richard Baker, Orpington; Peter Robert Archer, West Wickham, and Patricia Ann West, Orpington, all of England, assignors to Sira Institute, Kent, England

Continuation of Ser. No. 88,791, Nov. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 65,824, Aug. 21, 1970, abandoned. This application June 12, 1973, Ser. No. 369,334
Claims priority, application Great Britain, Aug. 26, 1969, 42500/69; Nov. 13, 1969, 55595/69
Int. Cl. H01j 39/12
U.S. Cl. 250—550 33 Claims



A method and apparatus for analysing two-dimensional patterns, particularly printed matter carried on sheet-like objects, and for inspecting such sheet-like objects to locate defects therein.

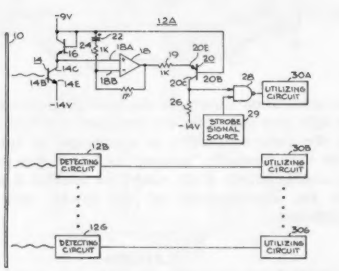
The invention performs such analysis of inspection by subjecting the moving pattern or sheet to light which may be incoherent and scanning the light beam to periodically vary its intensity at some stage in the process. The spatial frequency of scanning (cycles/mm) is preferably variable and the scanned light as affected by the pattern or sheet is used to produce an electrical test signal as a function of the fourier transform thereof. The test signal is subsequently compared with a reference signal or stored data to evaluate the characteristics of the pattern or to determine the presence of defect-indicative information.

3,814,944

MARK SENSE CARD READER

James K. Berger, Sherman Oaks, Calif., assignor to Computer Design Corporation, Los Angeles, Calif.

Filed May 24, 1973, Ser. No. 363,649
Int. Cl. G08c 9/06
U.S. Cl. 250—555 4 Claims



In a circuit arrangement for responding to the presence or absence of a plurality of marks on a card, a means is provided for enabling each of a plurality of mark-sensing circuits to respond to the percentage change in the light reflected from the card, rather than to absolute light level changes, whereby the range of responses of the individual circuits is narrowed considerably and therefore the threshold which must be exceeded for the following detection circuits to respond, may be easily established.

3,814,945
APPARATUS FOR AUTOMATIC INSPECTION OF MATERIALS

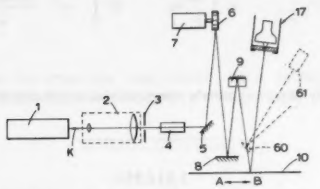
Anthony John Allnutt, Chiselhurst; Barry John Biddles; Richard Anthony Brook, both of Sidcup; Robert Ernest Vickers Semos, Paddock Wood, and Robert Noel West, Orpington, all of England, assignors to Sira Institute, Kent, England

Filed Mar. 8, 1972, Ser. No. 232,894

Claims priority, application Great Britain, Mar. 9, 1971, 6347/71; Nov. 9, 1971, 51940/71

Int. Cl. G01n *21/30*

U.S. Cl. 250—571 **28 Claims**



Apparatus for automatically inspecting materials to locate defects or flaws by directing light onto or through the material and by providing an electrical signal from the light influenced by the material. A scanning means serves to scan the material. In one construction the scanning means is a rotatable body with light-reflective surfaces on its periphery the body being used to direct the light from a source onto the material as a line scan. In another construction the scanning means is a rotatable drum with lenses disposed around its periphery, the lenses serving to receive light influenced by the material. A static reflecting means which may comprise a cylindrical mirror or a special arrangement comprising a beam splitting device combined with one or more pieces of retroreflective tape is arranged to direct light to or from the material. The rotatable body and the detecting means producing the electrical signal are located at conjugate positions in relation to the optical system comprising the static reflecting means and the material. Two objects are at conjugate positions, that is in mutual conjugacy, when rays of light diverging from either object will be brought to focus at the other object. Alternatively the source and the rotatable drum are located at conjugate positions in relation to the said optical system.

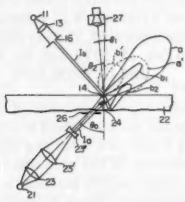
3,814,946
METHOD OF DETECTING DEFECTS IN TRANSPARENT AND SEMITRANSPARENT BODIES

Shiro Takahashi, and Takeshi Asao, both of Kitakyushu, Japan, assignors to Asahi Glass Co. Ltd., Tokyo, Japan

Filed Dec. 4, 1972, Ser. No. 312,103

Int. Cl. G01n *21/30, 21/16, 21/32*

U.S. Cl. 250—572 **2 Claims**



A method and apparatus for detecting defects in a transparent or semitransparent plate having a figured surface and an oppositely disposed smooth surface. A first light source is disposed on one side of the plate while a second light source is disposed on the opposite side so that the first light source and the second light source form, in conjunction with a photodetector, first and second optical systems respectively. The first optical system detects an internal defect in the plate by means of light which has passed through the plate and has been scattered by internal defects. The second optical system detects defects present in the smooth surface of the member by detecting light which has been reflected from the plate and scattered by surface defects.

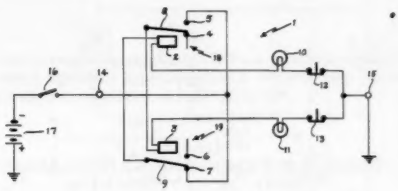
3,814,947
ELECTRICAL CIRCUIT FOR PROVIDING AUTOMATIC ALTERNATE SWITCHING

Jerome D. Friedman, 210 Summer St., Somerville, Mass. 02144

Filed May 21, 1973, Ser. No. 362,024

Int. Cl. H05b *39/10*

U.S. Cl. 307—41 **1 Claim**



Alternate switching between two parallel circuits is accomplished by the use of a relay and an incandescent lamp in each circuit. Each circuit is routed through the energization coil of its own relay and the contact and off terminal of the relay in the other circuit to prevent simultaneous closure of both circuits. Increased resistance in the circuit in use due to temperature rise in the incandescent lamp causes the other circuit to close following any interruption of the current supply. Appropriate intermittent breaking of the supply circuit effects automatic alternate flip-flop type switching between circuits.

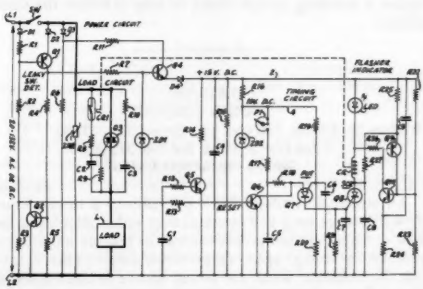
3,814,948
UNIVERSAL ON-DELAY TIMER

Russell P. Schuchmann, Racine; Herman P. Schutten, Elm Grove; Isadore Small, III, Milwaukee, and Donald L. Van Zeeland, Franklin, all of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 10, 1972, Ser. No. 296,275

Int. Cl. H04h *7/00*

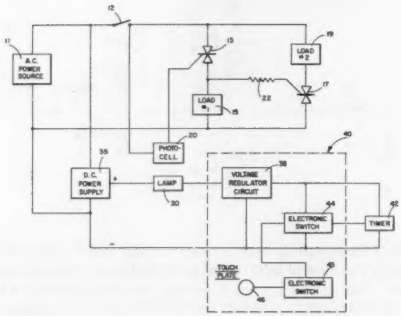
U.S. Cl. 307—141 **10 Claims**



An on-delay timer comprised substantially entirely of solid state elements for energizing a load a timed interval after the pilot switch is closed. Upon reopening the switch, the load is immediately deenergized and the timer is automatically reset

into readiness for another timing operation. The timer is universal in that it can be operated on a wide range of voltages (20 to 132) of either D.C. or 50/60 Hz A.C., and the value of the load current can be from a few milliamperes to a value limited by the capabilities of the components used, such as one ampere for a typical timer. It incorporates a leaky switch detector that enables proper operation even if the switch leaks current to some extent. An indicator indicates "off," timing (flashing) and "on" conditions.

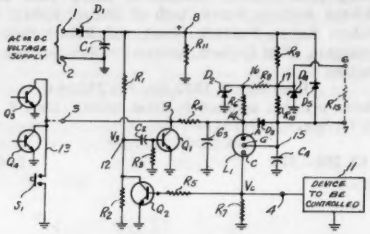
3,814,949
TIMING CONTROL DEVICE
Stanley Weinberg, 3009 Danalda, Los Angeles, Calif. 90066
Filed Sept. 18, 1972, Ser. No. 289,789
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **9 Claims**



A timing control device which is suitable for use in controlling equipment in a photographic dark room, includes a pair of electronic switches for alternatively activating either of two loads. A timer is provided which utilizes a wire wound potentiometer for setting a precise timing period. The timing circuit, which includes a resistive-capacitive charging circuit, is utilized to generate a ramp voltage which is fed to the anode of a programmable unijunction transistor, the output of the timing control potentiometer being fed to the gate of this transistor to set the program therefor. The programmable unijunction transistor is utilized to provide a keying signal which actuates an electronic switch which in turn controls the switching circuits associated with the loads. Initiation of the timing action is controlled by means of a touch plate which actuates a switching circuit which in turn activates the timing circuit.

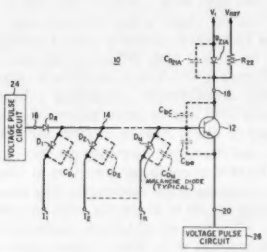
3,814,950
TIMING CIRCUIT
William M. Adams, 746 Oak Ln., Bryan, Tex. 77801
Filed Dec. 8, 1972, Ser. No. 313,405
Int. Cl. H01h *7/00, 43/00*
U.S. Cl. 307—141 **10 Claims**

An electronic timing circuit that utilizes a three-element glow discharge lamp and operates from either alternating current or direct current power sources to provide a direct current control voltage upon completion of a desired timing interval, for example, when the power source is interrupted for more than a predetermined period of time and is then restored. A predetermined time delay is provided before the direct current control voltage is removed following removal of the power source. Another time delay is provided before the direct current control voltage returns following restoration of the power source. The circuit includes independently operable reset means which can be operated either locally and



manually or by a remotely operated electronic circuit arrangement.

3,814,951
MULTIPLE FUNCTION LOGIC CIRCUIT
Jerry Mar, Scotch Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 15, 1972, Ser. No. 306,733
Int. Cl. H03k *19/34, 19/36*
U.S. Cl. 307—215 **6 Claims**

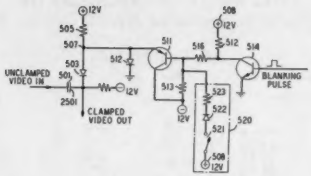


A logic circuit configuration which can be utilized to perform NOR and NAND logic operations, comprises a junction transistor, a plurality of input diodes and a diode used for resetting the circuit. The amplitude of a voltage pulse applied to a control terminal coupled to the emitter determines which of two logic functions is obtained.

3,814,952
DUAL MODE VIDEO CLAMPING CIRCUIT
Dale Everett Lynn, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 15, 1972, Ser. No. 315,490
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **9 Claims**

Unclamped video signals are coupled to the first plate of a capacitor, the second plate of which is connected to a resistor which discharges it and to a clamping diode which limits the discharge in proportion to the potential of its other terminal. During the active interval, this potential is maintained at a first level by a forward-biased diode to ground. Blanking pulses bias the base of a transistor to a potential which reverse biases the diode to ground and which affords to the clamping diode the base voltage of the transistor less a base-emitter diode drop. Whenever graphics information is transmitted, the bias voltage of the transistor base is altered, as is the voltage sup-

plied to the clamping diode. This alteration is achieved by means of a series combination of a resistor and a diode, connected to the transistor base, which, upon occurrence of graphics transmission, is coupled to a voltage supply.

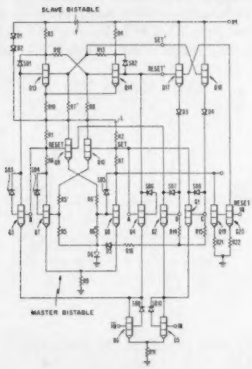


3,814,953

MASTER-SLAVE BINARY DIVIDER CIRCUIT

Shashi D. Malaviya, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,121
Int. Cl. H03k *3/12, 3/286*
U.S. Cl. 307—289 13 Claims



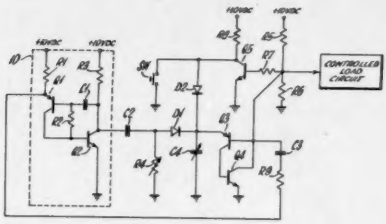
A binary divider circuit of the master-slave type. The master bistable flip-flop and the slave bistable flip-flop are arranged in series between the voltage supply lines so that current flows from one of the supply lines through one of the bistable circuits and then through the other of the bistable circuits into the other supply line. The series arrangement of the bistable circuits provides reduced power dissipation and increased switching speed. The disclosed embodiment further comprises diodes extending from one voltage supply line to the master bistable circuit for bypassing current around the slave bistable circuit and to the master bistable circuit so as to provide higher output power and/or faster switching speed for the master bistable circuit. The diodes further function as a voltage regulator for maintaining the voltage across each bistable circuit approximately constant to prevent the bistable circuits from interacting with each other as their respective impedances vary during switching operations.

3,814,954

VARIABLE INTERVAL TIMER CIRCUIT

Arthur F. Cake, Smithtown, Long Island, N.Y., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed May 19, 1972, Ser. No. 255,137
Int. Cl. H03k *17/26*
U.S. Cl. 307—293 9 Claims



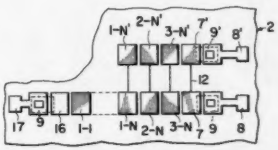
A circuit employing relatively small capacitances to provide an output signal for a predetermined, variable time period measured from the closing of a control switch.

3,814,955

CHARGE COUPLED SEMICONDUCTOR ELEMENT WITH NOISE CANCELLATION

Yokichi Itoh, Hachioji, and Hideo Sunami, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Chiyoda-ku, Japan

Filed June 5, 1972, Ser. No. 259,592
Claims priority, application Japan, June 4, 1971, 46-38676
Int. Cl. H01l *11/14*
U.S. Cl. 307—304 6 Claims



A charge coupled semiconductor element comprises a main path into which charges, as signals, are injected to be shifted therethrough, and a by-path into which the charges, as signals, are not injected the outputs of said main path and said by-path being differentially detected as a signal.

3,814,956

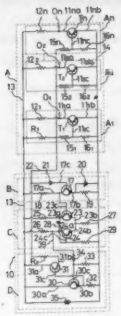
CONTACTLESS SWITCHING APPARATUS

Noboru Masuda, Kawaguchi, and Masasi Kuroyanagi, Tokyo, both of Japan, assignors to Denki Onkyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 256,571, May 24, 1972, abandoned. This application June 7, 1973, Ser. No. 367,825
Claims priority, application Japan, May 24, 1971, 46-35398
Int. Cl. H03k *17/04*
U.S. Cl. 307—309 15 Claims

A contactless switching apparatus, wherein a plural number of semiconductor elements having a variable resistance effect which are designed to vary the resistance value through respective actuating means are connected in parallel to the power supply, the detection circuit detects variation of the resistance value of at least one of said semiconductor elements, the power switching circuit is actuated with this detection of resistance variation to supply the current respectively to said

semiconductor elements and a unit switch circuit only, the resistance value of which varies, of a plural number of unit



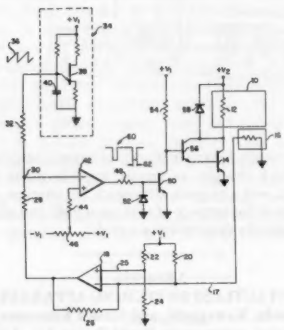
switch circuits which respectively have the semiconductor elements.

3,814,957

PRECISION TEMPERATURE CONTROLLER

Allan S. Way, Irvine, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 22, 1973, Ser. No. 334,977
Int. Cl. H03k 17/00
U.S. Cl. 307—310 5 Claims



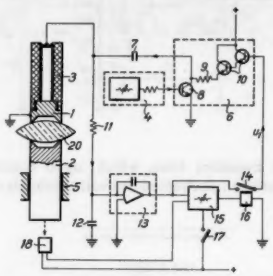
A precision temperature controller utilizing a temperature sensitive resistive element in thermal relationship to an object to be heated, the element being connected in a bridge circuit to derive an error signal proportional to deviation from a desired temperature, the error signal being summed with a sawtooth voltage, the output so obtained being compared with a reference voltage in an operational amplifier to derive a pulsed output having a pulse width proportional to the error signal, the pulse width being used to control the time duration of energization of a heating element in proximity to the resistive element.

3,814,958

VIBRATORY ALIGNMENT SYSTEM FOR LENSES IN MOUNTINGS

Knut Heitmann, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Sept. 15, 1972, Ser. No. 289,348
Claims priority, application Germany, Sept. 27, 1971, 2148102
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 7 Claims



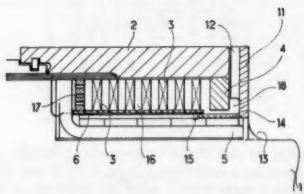
Apparatus and method for centering of lenses in the bell tension method in which the alignment of the lens is achieved by vibration at a high frequency.

3,814,959

COOLING ARRANGEMENT FOR ROTARY ELECTRIC MACHINES

Christian Lehuen, Cravanche, and Roger Gillet, Belfort, both of France, assignors to Societe Generale De Constructions Electriques Et Mecanique (Alsthom), Paris, France

Filed June 23, 1972, Ser. No. 265,474
Claims priority, application France, June 23, 1971, 71.22965
Int. Cl. H02k 9/00
U.S. Cl. 310—55 7 Claims



In the cooling with gas of the rotor winding heads of rotary electric machines, such as turbogenerators, having axial inlet and outlet channels for the gas disposed under the winding heads, channels are made up of a succession of axial notches within the shaft of the rotor, closed by an insulating tube which is pressed against the winding heads by centrifugal force and equipped with sealing bands or seals gliding in grooves located in the rotor shaft between the axial notches.

3,814,960

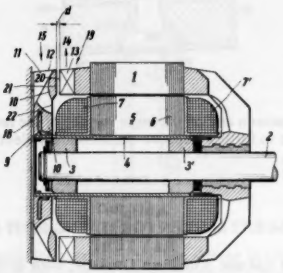
EXTERNAL ROTOR-TYPE ELECTRIC MOTOR

Martin Burgbacher, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Continuation of Ser. No. 294,899, Oct. 4, 1972, abandoned.
This application Jan. 31, 1973, Ser. No. 328,489
Claims priority, application Germany, Apr. 7, 1972, 7213003 [U]
Int. Cl. H02k 7/00
U.S. Cl. 310—67 8 Claims

In an external rotor-type electric motor having a flange for mounting against a wall, wherein the flow of cooling air to the

stator winding would ordinarily be obstructed by the wall and flange, centrifugal impeller air ducts on the rotor end draw in



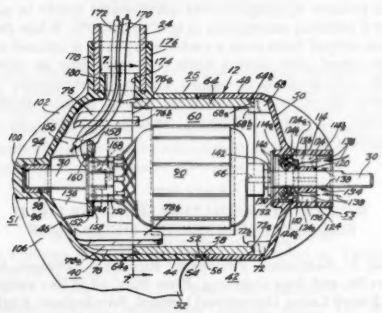
cooling air to one end of the stator winding through ducts extending inwardly through the flange.

3,814,961

TROLLING MOTOR STRUCTURE

Isaac Hilton Nelson, and Heyward Taylor Spinks, both of Columbus, Miss., assignors to Ambac Industries, Incorporated, Columbus, Miss.

Filed Aug. 2, 1972, Ser. No. 277,145
Int. Cl. H02k 5/12
U.S. Cl. 310—87 8 Claims



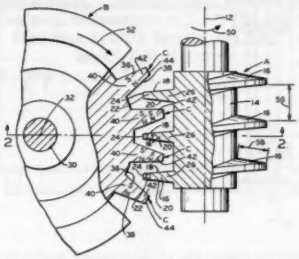
A trolling motor for operation immersed in water is provided including a watertight motor housing having a first end section and a second end section of a polymeric material, flux generating means supported by the motor housing, and an armature assembly having a shaft rotatably supported by the motor housing. The trolling motor housing is designed in a manner to sufficiently dissipate heat generated by operation of the motor to the water to prevent deformation of the housing, and the polymeric material of the motor housing is characterized by its thermal stability at normal operating temperatures of the motor when cooled by water in a predetermined manner, its high resistance to deformation and to breakage under impact, and its resistance to deterioration by water during normal use of the motor.

3,814,962

MAGNETIC WORM DRIVE

Max Baermann, Bezirk, Koln, 506 Bensberg, Wulshof, Germany

Filed Nov. 22, 1972, Ser. No. 308,682
Claims priority, application Germany, Dec. 2, 1971, 2159753
Int. Cl. H02k 49/10
U.S. Cl. 310—103 11 Claims



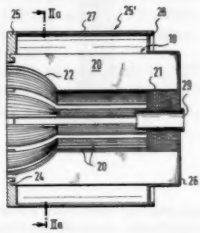
A magnetic worm gear drive includes a worm gear having a helical tooth of permanent magnet material. A worm wheel has a plurality of circumferentially spaced teeth of permanent magnet material. The teeth on the worm wheel interdigitate with the tooth on the worm gear. The teeth are magnetized so that like poles on the worm gear tooth and worm wheel teeth face one another. Rotation of the worm gear causes rotation of the worm wheel by magnetic repulsion.

3,814,963

STATOR FOR ROTATING ELECTRICAL MACHINES

Nikolaus Laing, Hofener Weg 35 bis 37, Aldingen bei Stuttgart, Germany

Filed Sept. 8, 1972, Ser. No. 287,266
Claims priority, application Austria, Sept. 17, 1971, 8081/71
Int. Cl. H02k 1/06
U.S. Cl. 310—217 10 Claims



In a stator for rotating electrical machines, whose pole teeth extend parallel to the axis of the rotor, the ends of the teeth are, in the region of the rotor, so joined to each other by connecting elements of magnetically non-conducting material, that distortion of the stator in a radial direction as well as cracking of the teeth during the operation of the machine are prevented.

3,814,964

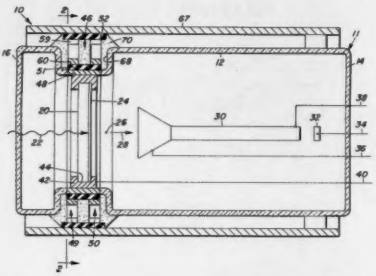
EXTERNAL PHOTODETECTOR COOLING TECHNIQUES

Ronald S. Ace, Greenbelt, Md., assignor to Ace Sophisticates Incorporated, Greenbelt, Md.

Filed Jan. 19, 1973, Ser. No. 324,922
Int. Cl. H01j 1/02
U.S. Cl. 313—39 18 Claims

A technique is disclosed for improving the performance of photoemissive devices such as the photocathode of a

photomultiplier tube by reducing thermal electron emission noise and thus increasing the signal to noise ratio. A thermoelectric cooler is positioned outside the evacuated envelope of the photoemissive device but in thermal communication with the device through a thermally conductive link arranged within and extending through the wall of the envelope.



This conductor places the photoemissive device in direct heat exchange relationship with the external thermoelectric cooler while isolating the cooler from the remainder of the tube structure whereby the device is efficiently cooled without the need for cooling the remaining elements of the tube. This permits efficient cooling while at the same time avoiding the expense and bulk of conventional cryostatic coolers.

3,814,965

COLOR IMAGE PICK-UP TUBE HAVING A SILICON TARGET PLATE

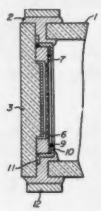
Taroemon Matsumura, Suita, and Tadashi Hasegawa, Kyoto, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed July 25, 1972, Ser. No. 274,932

Claims priority, application Japan, July 28, 1971, 46-57055

Int. Cl. H01j *29/36*

U.S. Cl. 313—367 **4 Claims**



In a color image pick-up tube using a silicon target plate as a photo-electric transducer, the main portion of the face plate is slightly elevated except at its peripheral annular portion to form a flat-topped convexity on which a color filter is formed and the peripheral protrusion of the silicon target plate is fastened to the peripheral annular portion of the face plate, so that the target area of the target plate is arranged in opposition to the color filter with a small gap left therebetween.

3,814,966

POST-DEFLECTION ACCELERATION TYPE COLOR CATHODE-RAY TUBE

Akira Misumi, and Toshiaki Kasai, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

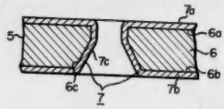
Filed Sept. 7, 1972, Ser. No. 286,914

Claims priority, application Japan, Sept. 8, 1971, 46-80885

Int. Cl. H01j *29/06, 29/28*

U.S. Cl. 313—408 **3 Claims**

A post-deflection acceleration type color cathode-ray tube including a shadow mask having on the surface thereof a secondary electron emission preventing layer made of graphite. Such graphite layers may also be applied on the



phosphor screen and on the inner surface of the funnel portion of the tube to further improve the secondary electron preventing effect.

3,814,967

LUMINESCENT SCREEN FOR FLYING-SPOT CATHODE-RAY TUBE

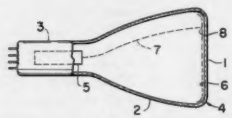
Masanobu Takata; Kuniharu Osakabe, both of Mobara, and Yoshio Murata, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1972, Ser. No. 319,936

Claims priority, application Japan, Dec. 29, 1971, 46-3468

Int. Cl. C09k *1/54;* **H01j** *29/20*

U.S. Cl. 313—468 **5 Claims**



A luminescent screen of a mean film thickness of 20 to 50 μ to be provided on the inner surface of the face of a flying-spot cathode-ray tube, which is formed of a cerium-activated rare-earth silicate phosphor having a mean particle diameter of 15 μ or less prepared by calcining at least either one of yttrium oxide or gadolinium oxide, cerium oxide, silicon oxide, and 1 to 20 percent by weight of an alkali metal halide in air or under a reducing atmosphere at 900° to 1,300°C. When the luminous output from such a cathode-ray tube is utilized as an image signal after having been converted into an electric signal, it is possible to ensure a high signal-to-noise ratio between the signal and the noise from a photo-cathode in response to said luminous output incident to the photocathode.

3,814,968

SOLID STATE RADIATION SENSITIVE FIELD ELECTRON EMITTER AND METHODS OF FABRICATION THEREOF

Harvey C. Nathanson, Pittsburgh; Richard N. Thomas, Murrysville, and Jens Guldberg, Penn Hills, all of Pa., assignors to Joseph Lucas, (Industries) Limited, Birmingham, England

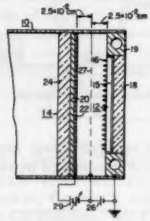
Filed Feb. 11, 1972, Ser. No. 225,517

Int. Cl. H01j *39/06, 39/16*

U.S. Cl. 313—95 **13 Claims**

A solid state radiation sensitive field emitter cathode comprising a single crystal semiconductor member having a body portion with a uniform array of closely spaced and very sharp electron emitting projections from one surface in the form of needles or whisker like members. Electrons are emitted into vacuum when a planar-parallel positive anode is mounted in close proximity to the surface. The cathode is responsive to input radiation such as electrons or light directed onto the cathode in modifying the electron emission from the array of electron emitter projections. The method of manufacturing the cathode by providing a predetermined pattern or mosaic of islands of a material exhibiting a greater etch resistant property than the semiconductor material, on a wafer of a semiconductor material and then etching out between and

beneath the islands to undercut to a point where the islands are supported by only a small whisker of the semiconductor material. Removal of the islands results in an electron emitter being exposed from beneath each island wherein carriers generated within the body portion and also carriers generated



within the depletion regions of the tips diffuse to the electron emitter projections wherein establishment of a high electric field at the tips of the electron emitter projections results in electron emission primarily due to conduction band tunneling. The device provides about 10^6 emitting points of close proximity so as to effect photographic-like imaging.

3,814,969

GAS DISCHARGE TUBE WITH PHOSPHOR COATING AND ELONGATE ELECTRODES

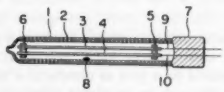
Shigeru Kamiya; Hitoshi Ohtsuka; Kensaku Ueda, all of Osaka, and Masashi Sangen, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Osaka-fu, Japan

Filed Oct. 24, 1972, Ser. No. 299,909

Claims priority, application Japan, Oct. 25, 1971, 46-84833; Oct. 25, 1971, 46-84834

Int. Cl. H01j *61/06, 61/64*

U.S. Cl. 313—486 **6 Claims**



A gas discharge tube is provided which comprises a glass tube, a coating of phosphor applied to the inner walls of the glass tube, a pair of electrodes disposed in parallel to each other along the substantial length of the glass tube, and some amounts of mercury and a neon-argon gas mixture or a neon-helium-argon gas mixture.

3,814,970

GAS DISCHARGE DISPLAY PANELS

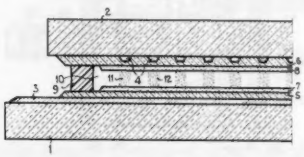
Jean Philippe Reboul, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 13, 1973, Ser. No. 350,711

Claims priority, application France, Apr. 19, 1972, 72.13828

Int. Cl. H01j *61/30*

U.S. Cl. 313—221 **4 Claims**



Gas discharge display panels presenting improved electrical characteristics due to the presence, upon the surfaces in contact with the gas being ionised, of a metal oxide whose electronic configuration incorporates an unsaturated f electron-shell for example thorium oxide or gadolinium oxide.

3,814,971

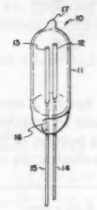
FILL GAS MIXTURE FOR GLOW LAMPS

Ashok K. Bhattacharya, Lyndhurst, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1973, Ser. No. 336,980

Int. Cl. H01j *61/16*

U.S. Cl. 313—226 **5 Claims**



A glow lamp for use as a circuit component or indicator lamp comprising an envelope, electrodes, lead-in wires connected to the electrodes and sealed in said envelope, the envelope contains a Penning mixture of neon and xenon with the xenon varying from 0.001 percent to 1.0 percent by volume. The use of the xenon-neon Penning mixture increases the life of the lamp without substantially increasing breakdown voltage.

3,814,972

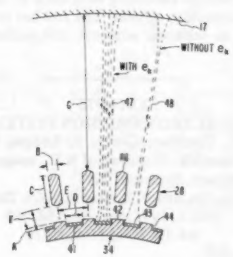
TRIODE ELECTRON TUBE WITH SEGMENTED CATHODE AND VANE GRID

William H. Sain, San Mateo, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 161,456, July 12, 1971, abandoned. This application May 3, 1973, Ser. No. 356,855

Int. Cl. H01j *1/46, 19/38*

U.S. Cl. 313—296 **14 Claims**



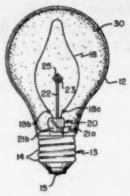
A high power, high frequency triode electron tube having a cylindrical segmented cathode with a coaxial cylindrical vane or bar type grid.

3,814,973

ELECTRIC LAMPS OF THE VIBRATING FILAMENT TYPE HAVING A CONDUCTIVE COATING

Wolfgang E. Thouret, Verona, N.J., and Rudolph Kaufman, Bronxville, N.Y., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Sept. 5, 1972, Ser. No. 286,551
Int. Cl. H01k *1/32*
U.S. Cl. 313—313 **7 Claims**



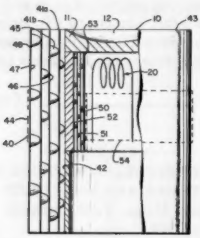
An incandescent lamp having a movable filament therein which is caused to oscillate in response to the field from a magnet in which at least a portion of the surface of the lamp envelope is coated with an electrically conductive material.

3,814,974

CATHODE GUN DEVICE

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 9, 1973, Ser. No. 349,156
Int. Cl. H01j *1/00*; H01k *1/02*
U.S. Cl. 313—326 **6 Claims**



A cathode gun device having a heat shield for improved operating efficiency is disclosed. The device includes a tubular cathode electrode and a thin metal foil made of low thermal conductivity and low emissivity material coiled about the cathode electrode for reflecting heat back to the cathode and conducting a minimum of heat. The foil has projections on a surface so as to separate adjacent coil surfaces from each other.

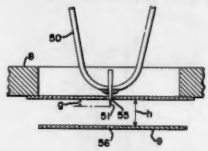
3,814,975

ELECTRON EMISSION SYSTEM

John E. Wolfe, Camillus; George E. Ledges, Liverpool, and Homer H. Glascock, Scotia, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Division of Ser. No. 847,972, Aug. 6, 1969. This application July 1, 1971, Ser. No. 158,768
Int. Cl. H01j *1/16, 19/10*
U.S. Cl. 313—336 **6 Claims**

A storage system for the mass recording and readout of digital data with ultra high resolution. An electron beam structure is provided for forming a beam of extremely small focused spot diameter, on the order of 0.1 microns, and high current density capability, on the order of 1,000 amperes per sq. cm., which records data by scanning over defined areas of the storage medium surface and micromachining elemental portions of said medium as a function of beam modulation. Readout may be subsequently accomplished by similarly



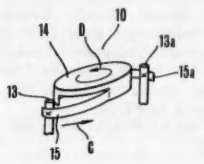
scanning the beam at reduced power density and detecting electrons that have been transmitted by or reflected from the storage medium.

3,814,976

THERMIONIC EMISSION DEVICE HAVING THERMAL EXPANSION COMPENSATING MEANS

Koichi Mitobe, and Katsuo Abe, both of Mobara, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Mar. 5, 1973, Ser. No. 338,366
Claims priority, application Japan, Mar. 22, 1972, 47-33118
Int. Cl. H01j *1/16, 19/10*
U.S. Cl. 313—345 **5 Claims**



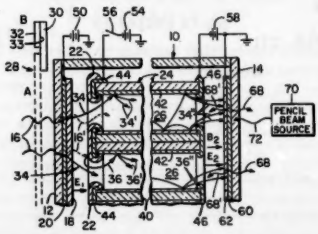
In a thermionic emission device for use in an electron gun assembly of a cathode ray tube, the thermionic emission device is comprised by a pair of conductive supporting members extending through an insulator substrate and a cathode member supported by the supporting members. The cathode member comprises a flat heater coated with thermion emissive substance and a pair of lead members extending in a direction perpendicular to the plane of the heater and connected between the heater and the supporting members.

3,814,977

IMAGE STORAGE DEVICE

Robert A. Simms, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 9, 1972, Ser. No. 261,358
Int. Cl. H01j *31/48*
U.S. Cl. 315—11 **19 Claims**



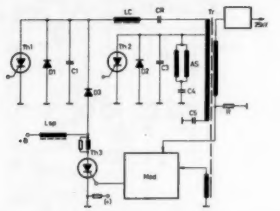
An electro-optic information storage device for converting an optical or electron image into an intensified optical output

image and, by the process of optical feedback, continuously refreshing the output image. An input optical image is converted by a photocathode into a corresponding electron image. The electron image is amplified by a multichannel plate, the output electrons of which bombard a layer of cathodoluminescent material, thereby generating an optical image which consists of two parts. One part is projected forward and serves as the optical output image. The second part is projected rearward and impinges upon the photocathode which releases photoelectrons that repeat the aforementioned process, thereby continually refreshing the output image.

3,814,978
HORIZONTAL DEFLECTION CIRCUIT FOR TELEVISION RECEIVERS

Gerd Dobbert, Deizisau, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 18, 1972, Ser. No. 272,828
Claims priority, application Germany, Sept. 7, 1971, 2144723
Int. Cl. H01j *29/20*
U.S. Cl. 315—27 TD **10 Claims**

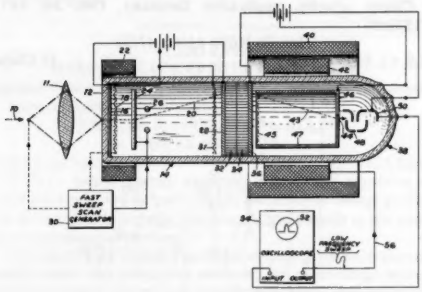


A horizontal deflection circuit for a television receiver wherein the high voltage necessary to operate the picture tube is produced by horizontal flyback pulses and an inductance, and a thyristor regulating switch controls the voltage provided to said inductance.

3,814,979
SMOOTHING OPTICAL CATHODE RAY TUBE

Edward H. Eberhardt, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 29, 1972, Ser. No. 293,683
Int. Cl. H01j *31/48*
U.S. Cl. 315—11 **7 Claims**

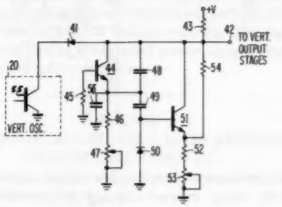


An image dissector is combined with an optical cathode ray tube to provide detection and observation of very short duration low level pulses of light. The cathode ray tube includes a photocathode, accelerating grid, fast sweep deflection electrodes and focusing coils to direct electrons onto a slow decay phosphor screen. This is optically coupled to the image dissector having another photocathode, low frequency sweep deflection coils, focusing coils and a scanning aperture which directs electrons into a multiplier for connection to a display or utilization device. The phosphor screen provides temporary storage of short duration light pulses while the slow scan dissector provides discrete output signal pulses of amplitudes proportional to brightness. The device has a sensitivity capable of detecting single photons with a time resolution in the order of picoseconds.

3,814,980
S-CORRECTED WAVEFORM GENERATOR

Peter Eduard Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Oct. 12, 1972, Ser. No. 296,862
Claims priority, application Great Britain, Oct. 12, 1971, 47423/71
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 GD **6 Claims**

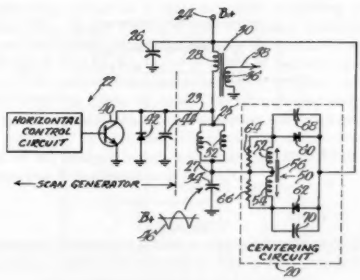


A television deflection waveform generator produces an "S" corrected sawtooth wave. A first charging circuit supplies energy to a second charging circuit which controls the development of the waveform during a first trace portion of the deflection cycle. The first charging circuit primarily controls the development of the corrected waveform during a second trace portion of the deflection cycle.

3,814,981
HORIZONTAL CENTERING CIRCUIT

George R. Rusk, Forest Park, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Jan. 29, 1973, Ser. No. 327,576
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 TD **9 Claims**



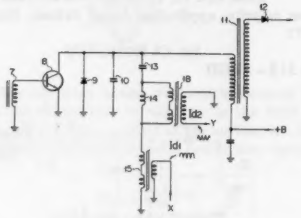
A horizontal centering circuit having a variable differential coil with its center tap coupled to the junction between a horizontal deflection winding and an S-shaping capacitor and its outer ends coupled to a B+ voltage supply through oppositely poled diodes and which conducts a selected amount of current from the B+ voltage supply to or from the capacitor

when the voltage thereacross is different from the B+ supply voltage. The horizontal centering current provides a selected DC offset current through a deflection coil for centering an electron beam on the screen of a cathode ray tube.

3,814,982
SIDE PINCUSHION DISTORTION CORRECTION CIRCUITRY

Masami Sakurai, Yokohama, and Saburou Tsuruta, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawashiki-shi, Japan

Filed Feb. 8, 1973, Ser. No. 330,673
Claims priority, application Japan, Feb. 15, 1972, 47-15840
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 GD **7 Claims**

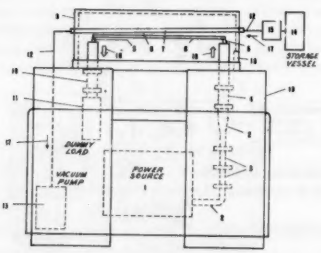


A side pincushion distortion correction circuit which is supplied with drive current having a parabolic wave form synchronizing with a vertical deflection current signal comprises a saturable reactor connected in series with a horizontal deflection coil and an additional saturable reactor connected equivalently in parallel with said horizontal deflection coil, said additional reactor having its unductance varied in the opposite direction to that of the first mentioned reactor.

3,814,983
APPARATUS AND METHOD FOR PLASMA GENERATION AND MATERIAL TREATMENT WITH ELECTROMAGNETIC RADIATION

Carl F. Weissfloch, 7750 16th Ave., St. Michel, Montreal 456, Quebec; Michael R. Wertheimer, St. Catherine St. W., Apt., 806, Montreal 215, Quebec, and Renato G. Bosisio, 75 Hebert, Longueuil, Quebec, all of Canada

Filed Feb. 7, 1972, Ser. No. 224,038
Int. Cl. H01j *7/46, 19/80*
U.S. Cl. 315—39 **25 Claims**

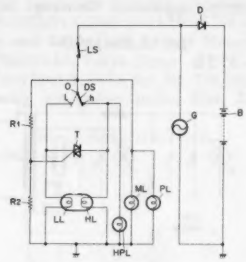


Apparatus for generating plasmas using electromagnetic energy in the microwave frequency range, having a source of microwave energy, a slow wave structure, conveying means for conveying microwave energy from the source to the slow wave structure, a plasma container and means for maintaining conditions of pressure and gas flow in the container. There is also provided a novel transparent radiation shield for use with such an apparatus. In another embodiment, there is also provided a slow wave structure and microwave energization means so that a region adjacent the structure will contain a predominance of degenerate $\pi/2$ mode or near degenerate $\pi/2$ mode electric field energy. Methods are also disclosed for treating various types of material to alter their properties using the above-described apparatus.

3,814,984
DEVICE FOR AUTOMATICALLY COMPENSATING DISCONNECTION IN HEAD LAMPS

Masayuki Morita, Tokoname, and Yoshitaka Marui, Nagoya, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Neshikasugai-gun, Aichi Pref., Japan

Filed Oct. 16, 1972, Ser. No. 298,018
Claims priority, application Japan, Oct. 14, 1971, 46-81075
Int. Cl. H05b *39/10*
U.S. Cl. 315—83 **8 Claims**

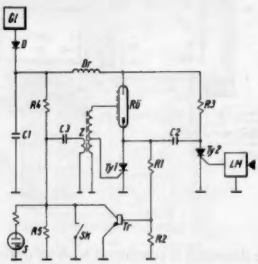


A device for automatically compensating a disconnection in a head lamp of a motor bicycle, employing a semiconductive switching element connected between a low-beam lamp circuit and a high-beam lamp circuit and adapted to become conductive when a voltage from an AC generator exceeds a predetermined value thereby to connect a high-beam lamp or a low-beam lamp to the AC generator for lighting the same when a disconnection occurs to the other lamp.

3,814,985
ELECTRONIC FLASH UNIT HAVING PROTECTIVE CIRCUIT FOR FLASH TERMINATING SWITCH

Wolfgang Pecher, Gremsdorf, and Helmut Schottner, Nurnberg, both of Germany, assignors to Metz Apparatewerke Inh. Paul Metz, Furth/Bay, Germany

Filed Oct. 17, 1972, Ser. No. 298,277
Claims priority, application Germany, Oct. 20, 1971, 2152140
Int. Cl. H05b *41/40, 41/32*
U.S. Cl. 315—241 P **11 Claims**



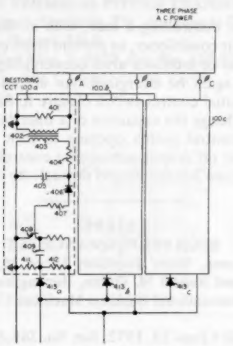
A semi-conductor switch interrupts the flashtube current, thereby terminating the flash when a blocking voltage is ap-

plied to its anode. The blocking voltage is derived from a capacitor. If the capacitor has not sufficiently recharged following a previous flash, the semi-conductor switch is not completely blocked causing it to burn out. Therefore, a transistor is provided whose emitter-collector circuit short-circuits the ignition capacitor when conductive. The base of the transistor is connected to the charging circuit for the capacitor furnishing the blocking voltage in such a manner that the transistor remains conductive until the capacitor charging current has decreased to a predetermined current.

3,814,986
MOTOR CONTROL CIRCUIT

Peter Zanini, Avon, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.

Division of Ser. No. 54,475, July 13, 1970, abandoned. This application July 17, 1972, Ser. No. 272,122
Int. Cl. H02h *7/08*
U.S. Cl. 317—13 R **9 Claims**



A circuit for supplying a progressively increasing amount of power to a plural phase motor during rotor acceleration employs a relaxation oscillator to vary the effective conduction angle for each applied line voltage phase. Circuitry is provided to restore an oscillator timing capacitor to a reference condition at a like point during each power phase cycle such that each phase supplies essentially the same monotonically increasing motor accelerating energy.

In accordance with varying aspects of the present invention, overload and undervoltage protective circuits remove power from the motor responsive to abnormal operating conditions.

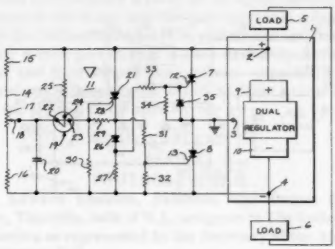
3,814,987
OVERVOLTAGE PROTECTION CIRCUIT

Manuel Frank Chacon, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Dec. 21, 1972, Ser. No. 317,290
Int. Cl. H02h *3/20*
U.S. Cl. 317—16 **12 Claims**

A D.C. power supply generally includes a regulator to establish a selected output voltage, and an overvoltage protector circuit which protects the power supply loads in the event of a regulator malfunction.

This disclosure includes two overvoltage protection circuits which utilize like protective methods. An overvoltage protector for a single low voltage supply includes a programmable unijunction transistor with a gate reference obtained from the temperature compensated reference within the voltage regulator, and triggered by the overvoltage condition appearing between its anode and cathode terminals. As such, this circuit is a three input circuit consisting of external references, monitored input and common. An overvoltage protector for high voltage dual supplies includes a temperature stable silicon unilateral switch that monitors part of the protected output and is triggered by an increase of that stabled voltage beyond the breakdown voltage of the device itself. As such, this circuit is a two input circuit requiring connection to monitored input and

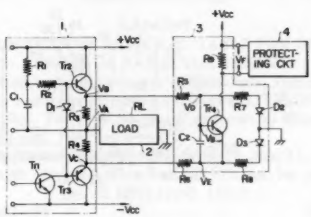


common. In both applications, low or high voltage, the voltage sensitive device triggers one or two silicon controlled rectifiers located across the monitored voltage outputs, thereby causing them to short out and to actuate the power supply's respective current responsive safety devices.

3,814,988
DETECTING CIRCUIT FOR A MAIN AMPLIFIER PROTECTING CIRCUIT

Hideo Ito, Fujisawa, Japan, assignor to Pioneer Electronic Corporation, Ohta-ku, Tokyo, Japan

Filed Dec. 7, 1971, Ser. No. 205,735
Claims priority, application Japan, Dec. 7, 1970, 45-121027[U]
Int. Cl. H02h *3/26*
U.S. Cl. 317—31 R **9 Claims**



A detecting circuit for a main amplifier protecting circuit, the detecting circuit having a pair of diodes connected to push-pull transistors of the amplifier each conducting when one of the transistors becomes ON, a load and resistors connected to the push-pull output transistors in the form of bridge circuits when the diode becomes ON, whereby the outputs of the respective bridge circuits are common, the main amplifier being protected by activating the protecting circuit from the output of the bridge circuits when the resistance of the load becomes less than a predetermined value.

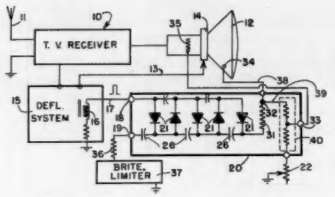
3,814,989
COMBINATION HIGH VOLTAGE MULTIPLIER AND FOCUS VOLTAGE DIVIDER FOR A TELEVISION RECEIVER WITH HOUSING MEANS

Michael S. Tamkin, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 4, 1973, Ser. No. 357,281
Int. Cl. H02b *1/10*; **H05k** *5/06*
U.S. Cl. 317—120 **6 Claims**

An insulated two-compartment, epoxy-filled case houses a combination high voltage multiplier and focus voltage divider

for a television receiver. The multiplier capacitors and diodes are mounted on an apertured insulated circuit board located in one compartment. An upstanding current limiting resistor, mounted to the board provides an internal high voltage connection point, below the level of encapsulant, for the picture tube anode lead and for a lead to the focus voltage divider resistor, which is printed on an alumina substrate and located in the other compartment.



3,814,990

ASSEMBLIES OF ELECTRICAL COMPONENTS

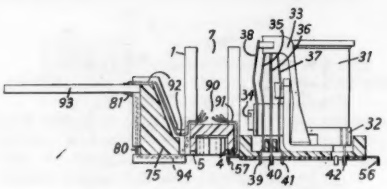
Bloomfield James Warman, Milan, Italy; Kenneth Frederick Elliott, and Jack Frederick Kennard, Bexley, both of England, assignors to GTE International Incorporated, New York, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,445

Claims priority, application Great Britain, Mar. 27, 1972, 14323/72

Int. Cl. H02b 9/00

U.S. Cl. 317—122 **14 Claims**



A component mounting and wiring arrangement which predominantly uses parts molded of plastic material and provides for modular mounting, and yet flexibility of connection, of largely standardized components, such as miniature multicontact electromagnetic relays in automatic telephone exchanges. The components are carried on multi-socket mounting strips which, with their sides abutting each other, are insertable in, and fastened to, a frame which in turn is removably mounted, in drawer-like fashion, in a rack or cabinet. Between any two adjacent component mounting strips there is provided a conduit member which serves as a wiring channel for accommodating the wires employed in the point to point wiring of the components carried by the frame, and is designed to fan these connecting wires out at suitable points across the frame and bring these wires out beneath the components for connection to terminals depending therefrom. A generally U-shaped cover is snapped over the conduit member so as to hold the wires in place by clamping. Adapters are provided to permit the connecting wires to be terminated in printed circuit panels. Provisions are also made for mounting printed circuit boards on the frame, in addition to, and in parallel with, the multi-socket mounting strips.

3,814,991

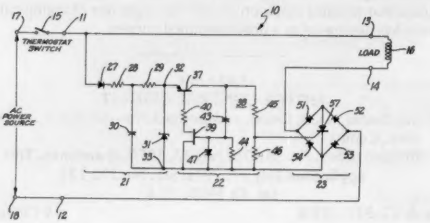
INTERLOCK CIRCUIT

William Lloyd Hewitt, Harbor City, Calif., assignor to Cam-Stat Incorporated, Los Angeles, Calif.

Filed Oct. 29, 1973, Ser. No. 410,386

Int. Cl. H02h 7/085

U.S. Cl. 317—141 S **4 Claims**



A circuit for controlling a load, such as the cooling compressor of an air conditioner, to prevent short cycling by utilizing a time delay or interlock after deenergizing a load, before the load can again be energized. An all solid state circuit operable on initial control switch closure to turn on power to the load and charge the capacitor of a time delay circuit, and operable on control switch opening to turn off power and maintain power off despite subsequent control switch closure until the capacitor has discharged through the delay circuit.

3,814,992

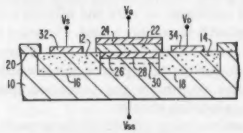
HIGH PERFORMANCE FET

Herbert J. Kump, Essex Junction; Lloyd M. Lambert, Jr., Hineburg, and Robert M. Quinn, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 22, 1972, Ser. No. 265,380

Int. Cl. H01c 7/14

U.S. Cl. 357—23 **10 Claims**



A field effect transistor having improved mobility and including an impurity doped surface channel portion containing a controlled amount of impurity opposite to that in the substrate. The devices of the invention are characterized by the provision of a metallurgical junction formed within the normal maximum depletion depth from the insulator-semiconductor interface of a field effect transistor. The built-in electric field, or space charge region, of the junction extends to the interface providing an enhancement mode device. The preferred embodiment includes a step-junction although structures having graded junctions are also disclosed.

3,814,993

TUNEABLE INFRARED PHOTOCATHODE

Andrew J. Kennedy, Lorton, Va., assignor to The United States of America ss represented by the Secretary of the Navy, Washington, D.C.

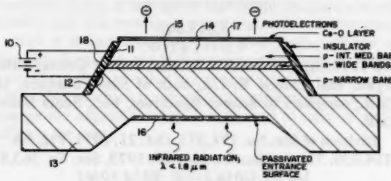
Filed Nov. 15, 1972, Ser. No. 306,786

Int. Cl. H01l 15/00

U.S. Cl. 357—30 **6 Claims**

A tuneable field assisted photocathode structured as a three layer double heterojunction device with a low work function

cesium oxide coating on the electron emitting surface. An internal field assistance bias aids the flow of electrons from a



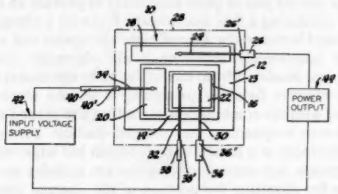
narrow bandgap region, where they are photo-generated, to the wider bandgap negative electron affinity surface region for vacuum emission.

3,814,994

FOUR TERMINAL POWER TRANSISTOR

Ronald M. Wagner, Seminole, Fla., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 7, 1973, Ser. No. 338,837
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 357—43 **3 Claims**



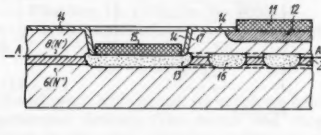
A distinctive transistor circuit for power switching and radio frequency applications characterized by a unique interconnection of input and output networks to a distinctive transistor construction. The circuit includes a power transistor with two discrete emitter leads for a single emitter region of the power transistor. One emitter lead is electrically connected to the collector region of the transistor through a power output load. The other emitter lead is electrically connected to the base region of the transistor through an input voltage supply.

3,814,995

FIELD-EFFECT GRIDISTOR-TYPE TRANSISTOR STRUCTURE

Stanislas Teszner, 49, rue de la Tour, Paris, France (75016)

Filed Mar. 12, 1973, Ser. No. 340,013
Claims priority, application France, Mar. 10, 1972, 72.08446; Nov. 9, 1972, 72.39748
Int. Cl. H01c *7/14*
U.S. Cl. 357—22 **4 Claims**



A field-effect semiconductor structure of the gridistor type comprises a wafer of semiconductor material of one type of conductivity having an upper and a lower surfaces, a drain electrode on said lower surface of the wafer, a gate of semiconductor material of the opposite type of conductivity embedded in the wafer, a plurality of conductive channels perpendicular to and surrounded by said gate, said gate being covered with an epitaxiably deposited layer of the said type of conductivity. A frame surrounding the gate and frame bars dividing the gate into compartments are embedded in the wafer and in ohmic contact with the gate. In order not to extend the gate thickness during the process of heightening the frame from its embedded level up to the upper surface, a pit is sunk opposite the frame and the gate contact is taken on the frame at the bottom of the pit. The gate, frame and frame bars have their middle part formed in a low-resistivity semiconductor layer and their lateral parts formed respectively in two high-resistivity semiconductor layers adjacent to and on both sides of the low resistivity layer.

3,814,996

PHOTOCATHODES

Ronald Edward Enstrom, Skillman, and Dennis Glendon Fisher, Titusville, both of N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 266,783, June 27, 1972. This application May 3, 1973, Ser. No. 357,037
Int. Cl. H01l *15/00*
U.S. Cl. 357—3 D **5 Claims**

A photocathode comprising a ternary alloy having the general formula:

$$Ga_{1-x}In_xAs$$

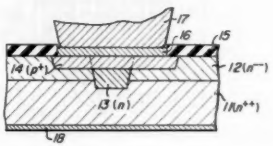
wherein x is an integer of from 0.15 to 0.21. The cathode is selectively responsive to infra-red radiation, particularly at the 1.06 micron wavelength level.

3,814,997

SEMICONDUCTOR DEVICE SUITABLE FOR IMPATT DIODES OR VARACTOR DIODES

Susumu Takahashi, Kokubunji; Hitoshi Sato, Tokyo; Yoichi Kaneko, Tokorozawa; Masatoshi Migitaka, Kokubunji, and Shinya Iida, Tama, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 152,355, June 11, 1971, abandoned. This application June 6, 1973, Ser. No. 367,366
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 357—58 **10 Claims**

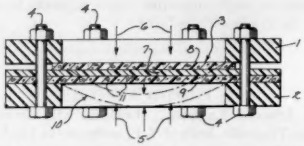


A semiconductor device suitable for IMPATT diodes or varactor diodes which are used in the microwave of millimeter wave band in which an n type GaAs body whose impurity concentration is about 8×10^{16} cm^{-3} having a small cross-sectional area surrounded by an intrinsic or n^- type GaAs layer is disposed on an n^+ type GaAs substrate region. A p^+ type region having a lateral extension far greater than that of the n type GaAs body is disposed over the n type GaAs body to form a small entirely flat area p–n junction therebetween. Ohmic electrodes are disposed on the p^+ type region and the n^+ type GaAs substrate. This structure provides a high breakdown voltage, a low junction resistance and a small junction capacitance, and facilitates the leading out of the electrode.

3,814,998
PRESSURE SENSITIVE CAPACITANCE SENSING ELEMENT

Paul E. Thoma, Burlington, and Jeannine O. Colla, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed May 18, 1973, Ser. No. 361,813
Int. Cl. H01g 7/00
U.S. Cl. 317—246 **23 Claims**



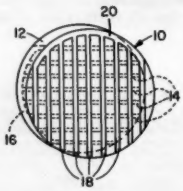
A diaphragm element includes thin outer conducting layers integrally bonded to the opposite sides of a core layer of silicone or other dielectric which is a resilient, flexible material, to form a single, integral, resilient, flexible structure.

The conducting layers are a matrix of the material of the dielectric core layer with carbon or like conductive particles embedded therein. One conducting layer is spaced peripherally from the edge of the core layer to thereby prevent electrical contact between the two conducting layers. The total unit is rigidly mounted about the peripheral edge with metallic contacts connected to the conducting layers as by a silver conducting paint applied to the outer surface of the layers. The element will thus flex to the side of the lower pressure with a change in the effective conducting area of the opposite conducting layers and a simultaneous decrease in the thickness of the dielectric inner core. Consequently, the capacitance of the unit varies as a function of the deflection and thereby in accordance with the pressure differential applied across the diaphragm element.

3,814,999
CRYOGENIC CAPACITIVE BOLOMETER

William N. Lawless, and Brent M. Wedding, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 15, 1973, Ser. No. 360,412
Int. Cl. H01g 7/04
U.S. Cl. 317—247 **12 Claims**

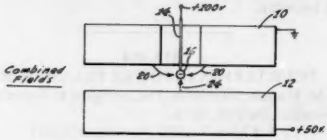


A capacitive bolometer suitable for measuring electromagnetic radiation when operated in the cryogenic temperature region. The dielectric material used in the bolometer element is one having a negative or nearly zero temperature coefficient of self-heating. The dielectric member of the element may be made from a composition in which strontium titanate, $SrTiO_3$, has been controllably crystallized in a glass matrix. A plurality of elongated electrically conductive members are disposed adjacent each of two substantially parallel surfaces of the dielectric member in a substantially parallel arrangement and spaced from one another. The electrically conductive members on one surface of the dielectric member are disposed in opposition to the plurality of members on the other surface and arranged substantially perpendicular thereto so that at least one elongated member on one surface of the dielectric layer crosses at least one of the elongated members disposed adjacent the opposite surface of the dielectric layer.

3,815,000
LEVITATOR

David T. Phillips; Herman H Brooks, both of Goleta; Philip J. Wyatt, and Chelcie B. Liu, both of Santa Barbara, all of Calif., assignors to Science Spectrum, Inc., Santa Barbara, Calif.

Division of Ser. No. 191,373, Oct. 21, 1971, Pat. No. 3,754,830. This application May 25, 1973, Ser. No. 363,824
Int. Cl. G01n 21/00; B01d 59/44
U.S. Cl. 317—262 E **8 Claims**

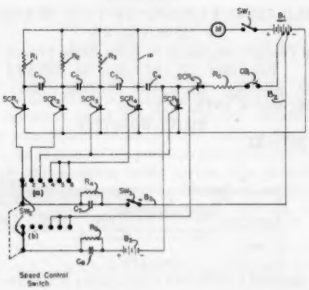


A levitator for use with a light scattering photometer unit including a spaced pair of plate electrodes to provide an electric field for producing a first electrostatic force on a charged particle located between the spaced plate electrodes and with the levitator additionally including a pin electrode extending through and insulated from one of the plate electrodes to provide an electric field for producing a second electrostatic force and with the combination of the first and second electrostatic forces suspending the charged particle between the plate electrodes at a location spaced from but adjacent to the pin electrode. An automatic servo system includes an optical detector for detecting the position of the charged particle to produce a control signal to adjust the electric fields to maintain the charged particle in the proper position.

3,815,001
SILICON CONTROLLED RECTIFIER MOTOR SPEED CONTROLLER

Joseph Jamieson, Plantation, Fla., assignor to Louis W. Parker, Ft. Lauderdale, Fla.

Filed Mar. 13, 1973, Ser. No. 340,853
Int. Cl. H02p 5/16
U.S. Cl. 318—139 **15 Claims**



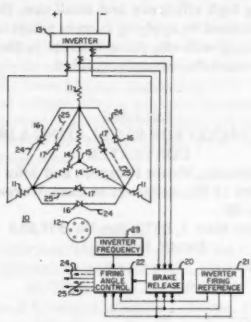
An electric motor, for driving an automotive vehicle, has its speed and torque controlled by variable impedance means connected to control the armature current in the motor. The impedance means comprises a plurality of series-connected resistors and silicon controlled rectifiers, connected in a parallel array, with the resistors having different values respectively; and different ones of the rectifiers are rendered conductive

to place different values of resistance in series with the motor armature circuit. Commutating capacitors interconnect the anodes of the rectifiers to turn off each rectifier when a next successive rectifier in the array is rendered conductive. The last rectifier in the array has no significant resistance in series therewith; and this rectifier is associated with a further capacitor which is in turn associated with two further silicon controlled rectifiers, one of which is rendered selectively conductive to charge the capacitor at a proper stage of the operation, and the other of which is subsequently rendered conductive to discharge the capacitor when it is desired to turn off the last rectifier in the array.

3,815,002
BRAKING CIRCUIT FOR ALTERNATING CURRENT INDUCTION MOTOR

Stefano Clemente, Monroeville, and Brian R. Pelly, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 29, 1973, Ser. No. 364,450
Int. Cl. H02p *3/20*
U.S. Cl. 318—209 **13 Claims**



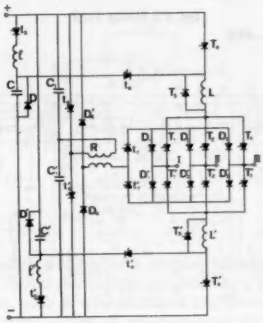
A braking circuit is provided for squirrel-cage induction motors supplied from a variable frequency inverter to obtain increased braking torque when the motor is used for dynamic or regenerative braking, as in traction drives. This is accomplished by connecting resistive means in series relation with the motor windings to cause a voltage rise across the windings when the motor is driven as a generator. Control means are also provided for removing the resistive means from the circuit during motoring operation, and for controlling the effective value of resistance during braking to control the braking torque.

3,815,003
COMBINED SWITCH AND CHOPPER FOR SUPPLYING AN A.C. MOTOR

Albert Wiart, Sannois, France, assignor to Jeumont-Schneider, Paris, France

Filed Nov. 10, 1972, Ser. No. 305,431
Claims priority, application France, Nov. 16, 1971, 71.40910
Int. Cl. H02p *3/20*
U.S. Cl. 318—211 **4 Claims**

A combined switch and chopper for supplying an a.c. motor with regenerative braking. The switch and chopper are characterised in that they comprise: a first set of routing thyristors whose anodes are connected to the positive side of a d.c. supply via a choke and the main thyristor of a first chopper and whose cathodes are connected to the motor terminals; a second set of routing thyristors whose cathodes are connected to the negative side of the supply via a second choke and the main thyristor of a second chopper and whose anodes are connected to the motor terminals; two thyristors for shunting the chokes; a first group of diodes whose cathodes are connected to the motor terminals and whose anodes are connected to a common point; a second group of diodes whose anodes are connected to the motor terminals and whose cathodes are connected to a common point; two switching thyristors connected in series between the common points, such thyristors being in antiparallel with the two diode

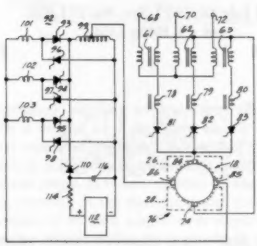


groups; means for switching the thyristors comprising more particularly an auxiliary circuit for cyclically and alternately switching each routing thyristor set by way of the corresponding switching thyristor and corresponding diode group; two free wheel circuits helping to hold the motor current during periodic interruptions of the motor power supply; and a recovery circuit for braking the motor when the same is generating.

3,815,004
ROTARY MOTOR

Marcel R. Sommeria, Palos Heights, Ill., assignor to Hyper-Loop, Inc., Bridgeview, Ill.

Filed June 6, 1973, Ser. No. 367,578
Int. Cl. H02p *5/08*
U.S. Cl. 318—440 **8 Claims**

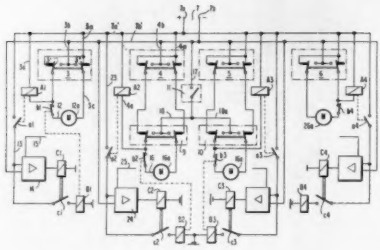


A rotary motor has an armature with a single continuous winding and a pair of spaced-apart windingless pole pieces surrounding said armature and formed of ferromagnetic material. The armature employs a ferromagnetic member having a plurality of slots arranged in parallel spaced-apart relation encircling the periphery of the armature, each slot containing a pair of conductors forming separate portions of said armature winding. A commutator is mounted for rotation with the armature, and is adapted to interconnect portions of the winding with two independent electrical power sources through four spaced brushes. The independent power sources each include a plurality of rectifiers for rectifying a multiphase source of a.c. power.

3,815,005
PROTECTIVE DEVICE FOR ELECTRICALLY OPERATED WINDOWS, ESPECIALLY OF MOTOR VEHICLES

Josef Berger, Notzingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Aug. 17, 1972, Ser. No. 281,300
Claims priority, application Germany, Aug. 17, 1971, 2141150
Int. Cl. H02p 1/22
U.S. Cl. 318—466 **10 Claims**

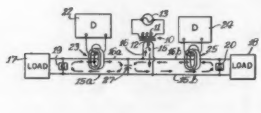


An installation for the protection against the squeezing-in by windowpanes or similar pivotal or displaceable structural parts actuable by reversible electric motors, particularly in motor vehicles, which includes a switch at each required place; an electronic control circuit is adapted to be fed with current by the respective switch of the structural part at the same time as the energizing circuit for the corresponding driving motor; the electronic control circuit responds to pulses produced by body contact with a predetermined part such as the upper edge of the windowpane and causes the standstill or reversal of direction of rotation of the driving motor.

3,815,006
SYSTEM TO DEENERGIZE MOTOR RESPONSIVE TO CURRENT

Richard E. Woods, Markle, and William H. Hohman, Bluffton, both of Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed July 14, 1972, Ser. No. 271,920
Int. Cl. H02p 1/04
U.S. Cl. 318—474 **21 Claims**

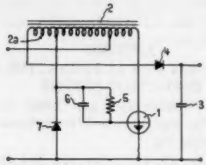


This disclosure deals with a telemetry system adapted to be coupled to power transmission lines, the system generating pulses at one location on the lines and detecting such pulses at another location. The system is designed for use with transmission lines carrying alternating current from a power supply to a plurality of loads connected in parallel branch lines, and includes one or more pulse generators, each of which is associated with one load and, when energized, generates a series of pulses. The system also includes one or more pulse detectors each of which is coupled by current transformer means to branch lines leading to a load. The impedance of the power supply is much less than that of each of the loads, and therefore pulses generated on one of the branch lines are not sensed by detectors on the other branch lines because the supply serves as a low impedance shunt path across the other branch lines.

3,815,007
DIRECT VOLTAGE CONVERTER, PARTICULARLY FOR USE IN TIME MEASURING INSTRUMENTS

Hubert Portmann, Saint-Imier, Switzerland, assignor to Compagnie des Montres Longines Francillon S.A., Bern, Switzerland

Filed Aug. 15, 1972, Ser. No. 280,863
Claims priority, application Switzerland, Aug. 26, 1971, 12515/71
Int. Cl. H02m 3/32
U.S. Cl. 321—2 **5 Claims**

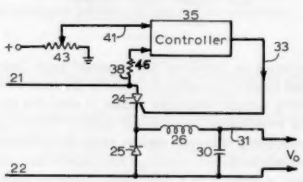


A direct voltage converter, particularly for use in electronic watches, having high efficiency and small size, the high efficiency being obtained by applying current pulses of very short duration compared with the pulse interval to the input of a transformer of which the output is rectified.

3,815,008
CONTROL CIRCUIT FOR REGULATING A DC-TO-DC CONVERTER

George H. Studtmann, Mount Prospect, and John K. Overzet, Bellwood, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 1, 1973, Ser. No. 337,053
Int. Cl. H02m 7/52
U.S. Cl. 321—44 **10 Claims**



A first control system includes a chopper (dc-to-dc converter) for passing part of an input voltage V_i through a filter to provide an output voltage V_o for energizing an inverter. A controller regulates the operation of the semiconductor switch in the chopper by providing an output signal which is a function both of a first input signal derived from the input circuit that supplies the input voltage V_i to the chopper, and of a second input signal derived from a reference member. In a second system the reference voltage input to the controller is replaced by an error voltage provided by a comparator. The comparator receives both the reference voltage signal and a second signal related to the output voltage V_o of the chopper-filter combination.

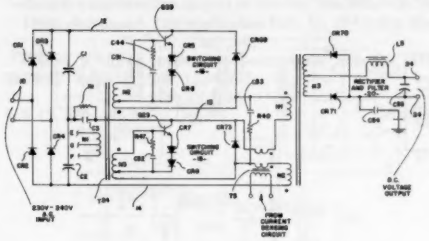
3,815,009
POWER INVERTER CIRCUIT

James K. Berger, Sherman Oaks, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed June 11, 1973, Ser. No. 368,605
Int. Cl. H02m 3/14
U.S. Cl. 321—45 R **5 Claims**

A high-frequency power inverter circuit is provided which responds to a first direct-current voltage to provide an alter-

nating-current voltage which may be rectified to provide a second direct-current voltage of different value than the first direct-current voltage. The first direct-current voltage is obtained by rectifying the alternating-current voltage from the usual alternating-current mains. The high-frequency power inverter circuit of the invention is constructed to operate on the



European standard 230–240 volt alternating-current voltages, and to be capable of being adapted by a simple connection to operate on the United States standard of 115–117 volts alternating-current voltage. This is achieved by providing two sections in the power inverter circuit which are effectively connected in series for the higher voltage input, and in shunt for the lower voltage input.

3,815,010

ELECTRONIC CONTROL DEVICES CALLED GOVERNORS-COMPARATORS FOR VEHICLE AUTOMATIC GEAR BOXES

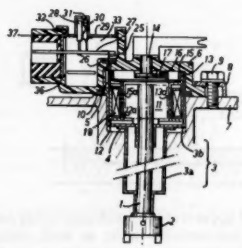
Claude Edmond Lombard; Camille Labaune, and Pierre Neubauer, all of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt (Hauts de Seine) and Automobiles Peugeot, Paris, both of, France

Filed Oct. 18, 1972, Ser. No. 298,652

Claims priority, application France, Oct. 26, 1971, 71.38490

Int. Cl. H02k

U.S. Cl. 322—28 **19 Claims**



Improvements in electronic governor-comparators for controlling vehicle automatic gear boxes, having a common casing for the governor and comparator with separate compartments which are obturated by separate members acting also as bearings or cooling means and wherein the electronic receiver is protected against internal and external over-voltages.

3,815,011

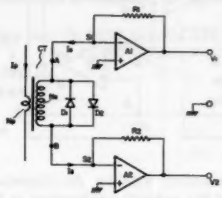
CURRENT TRANSFORMER TERMINATED BY ACTIVE LOAD ELEMENTS FOR PROVIDING PHASE-INVERTED SIGNALS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,411

Int. Cl. G01r *19/00*

U.S. Cl. 323—6 **17 Claims**



The secondary winding of a current transformer is terminated in a virtual short-circuit condition by a pair of active load elements, such as transresistance amplifiers, which provide, for example, a pair of phase-inverted output voltages proportional to current in the primary winding of the current transformer.

3,815,012

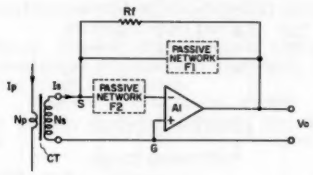
CURRENT TRANSFORMER WITH ACTIVE LOAD TERMINATION FOR PROVIDING, INTER ALIA, PHASE ANGLE ALTERATION

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,412

Int. Cl. G01r *19/00*

U.S. Cl. 323—6 **7 Claims**



The secondary winding of a current transformer is terminated in a virtual or near short circuit condition by an operational amplifier which has connected therewith. Circuit means, such as passive circuit elements, are provided for shifting the phase angle between current in the primary, or the secondary, winding of the current transformer and an output voltage produced by said amplifier in response to current in the secondary winding. The output voltage produced by the amplifier is proportional to the primary, or the secondary, current in the current transformer.

3,815,013

CURRENT TRANSFORMER WITH ACTIVE LOAD TERMINATION

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

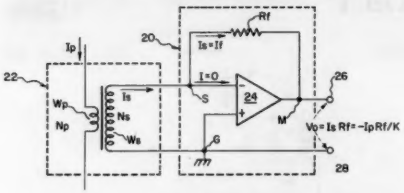
Continuation of Ser. No. 262,643, June 14, 1972, abandoned. This application May 31, 1973, Ser. No. 365,429

Int. Cl. G01r *19/00*

U.S. Cl. 323—6 **15 Claims**

A current transformer and transresistance amplifier are combined; the secondary winding of the current transformer

being connected to the input of the transresistance amplifier and being virtually short-circuited because of the very low input impedance of the transresistance amplifier. The transresistance amplifier, nevertheless, supplies an output voltage which is proportional to current in the primary winding of the current transformer. An output voltage is developed from the



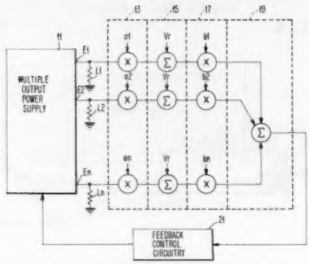
current in the secondary winding. An important advantage, among others, of the subject combination is that a current transformer having considerably lower volt-ampere capacity may be employed. A current transformer employed alone for the same purpose would have to have a much larger volt-ampere capacity.

3,815,014

COMPROMISE VOLTAGE CONTROL FOR TRACKING MULTIPLE OUTPUT POWER SUPPLY

James Howard Davis, and Donald Rhea Dobson, both of Lexington, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 21, 1973, Ser. No. 372,128
Int. Cl. G05f 1/46
U.S. Cl. 323—20 **3 Claims**



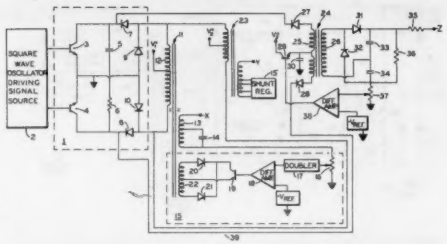
A feedback control system is utilized to control the output voltage levels of a power supply having multiple output voltage signals which relatively track one another This feedback control system encloses each output voltage signal within the feedback loop and allows independent definition of the tolerance of each voltage signal. Each output voltage signal is normalized and a percent error signal is obtained for each normalized voltage signal by comparison to a common voltage reference. The percent error signals are then weighted by factors which are inversely proportional to the defined tolerances for their associated voltage signals. An error control system is then responsive to the weighted percent error signals to control the output voltage levels of the power supply. In a first embodiment, the control system includes a summing network which provides a feedback correction signal to the power supply when the sum of the weighted percent error signals does not equal zero. In a second embodiment, the control system includes a switching network which provides a feedback correction signal to the power supply when the magnitude of the most negative weighted percent error signal does not equal that of the most positive weighted percent error signal.

3,815,015

TRANSFORMER-DIODE ISOLATED CIRCUITS FOR HIGH VOLTAGE POWER SUPPLIES

William A. Swin, and Flavian Reising, Jr., both of Fort Wayne, Ind., assignors to General Electric Company, Indianapolis, Ind.

Filed Feb. 20, 1973, Ser. No. 334,046
Int. Cl. G05f 1/48
U.S. Cl. 323—22 T **7 Claims**



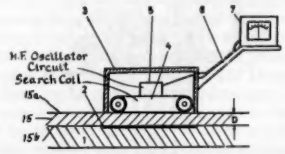
An improved power supply having a single input stage which operates a plurality of output stages. The input stage includes an isolation transformer or a push-pull drive circuit. This input stage controls a plurality of regulated output stages. The output stages may include either series or shunt regulators, however, at least one of the output stages includes a series regulator. The series regulated output stage includes a center tap transformer having a transistor connected to the center tap. The output voltage or current is sensed and fed back to the base of the transistor to regulate and keep constant the output voltage or current. A pair of rectifiers are connected between the series regulated output stage and the other output stages to provide isolation between the series regulated output stage and the other output stages.

3,815,016

METHOD OF MEASURING THICKNESS OF NONMETALLIC PAVING MATERIAL WITH COMPENSATION FOR PROPERTIES OF THE MATERIAL

Hans Nix, Geranienweg 20, 5 Cologne-Seeberg, and Werner Koob, Dagobert str. 17, 5 Cologne, both of Germany

Filed Oct. 8, 1971, Ser. No. 187,678
Claims priority, application Germany, Oct. 12, 1970, 2049976
Int. Cl. G01r 33/00
U.S. Cl. 324—34 TK **4 Claims**



A method and apparatus for nondestructively measuring the thickness of a non-metallic layer, or wall, which utilizes a metallic sheet-like structure placed in the plane of one surface of the layer, or wall, so that apparatus to propagate an electromagnetic radiation field can be positioned against the opposite surface of the layer, or wall, and the thickness determined as a function of changes in the radiation field caused by changes in the distance between the source of the field and the metallic structure; the apparatus being calibrated remotely from the location of the metallic structure by utilizing a second metallic structure and observing the effects when positioned at known distances from the radiation field.

3,815,017
BEAT FREQUENCY METHOD AND APPARATUS FOR MEASURING THE THICKNESS OF A LAYER OF MATERIAL OVERLYING A METALLIC SURFACE

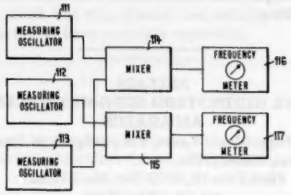
Peter Nopper, Leuernweg 17, Bartholomausweg 16; Heinz Zumbach, 2500 Biel, and Mathias Brunner, 2532 Magglingen, all of Switzerland

Continuation of Ser. No. 28,228, April 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 706,000, Feb. 16, 1968, abandoned. This application Nov. 16, 1972, Ser. No. 307,248

Claims priority, application Switzerland, Feb. 23, 1967, 2698/67; Aug. 11, 1967, 11344/67

Int. Cl. G01r *33/00*

U.S. Cl. 324—34 R **19 Claims**



A method and apparatus for measuring the thickness of a layer or coating of a body, wherein coils of at least two oscillators are under similar control of spaced areas of one or more layers or coatings, differences of the thicknesses at said areas being determined by forming and measuring the beat frequency of at least two oscillator frequencies.

3,815,018
MAGNETIC GAS ANALYZER USING A GAS CHAMBER FOR IMPROVED GAS FLOW WITH MAGNETS EXTERNAL TO SAID CHAMBER

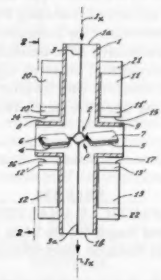
Theodor Gast; Lorenz Twisselmann, both of Berlin, and Wolf-Rudiger Marx, Bergen-Enkheim, all of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 20, 1972, Ser. No. 308,185

Claims priority, application Germany, Nov. 26, 1971, 2158715

Int. Cl. G01r *33/12*

U.S. Cl. 324—36 **9 Claims**



A test body is suspended in an inhomogeneous magnetic field in a chamber and exposed to a gas to be tested. The test piece comprises a pair of axially opposite arms movable about an axis of rotation, each arm including a non-magnetic, flat, disk-shaped member and a continuous double loop of wire supporting the members at opposite ends of the axis in a plane substantially at right angles to the lines of force in the nonuniform magnetic field. The test body varies its position in the magnetic field in accordance with variations in the composition of the gas, the latter being conducted past the disk-shaped members, to flow symmetrically to the rotation axis.

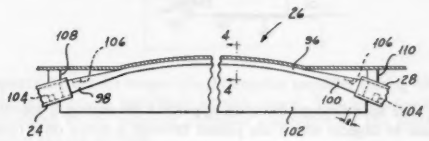
3,815,019
MICROWAVE LOW MOISTURE MEASURING APPARATUS

Sydney T. Wiles, Mississauga, Ontario, Canada, assignor to Electronic Associates of Canada Ltd., Downsview, Ontario, Canada

Filed Dec. 19, 1972, Ser. No. 316,456

Int. Cl. G01r *27/04*

U.S. Cl. 324—58.5 A **12 Claims**



Microwave apparatus for measuring the relatively low moisture content of a web such as that at the dry end of a papermaking machine in which a wave guide section comprising an elongated dielectric strip of material supported by conductive material and positioned in intimate contact with the web is supplied with a microwave signal so that a measurement of the resultant attenuation of the signal fed to one end of the guide section provides an accurate measure of the moisture content of the web.

3,815,020
CAPACITANCE/INDUCTANCE DISTANCE MEASUREMENT DEVICE

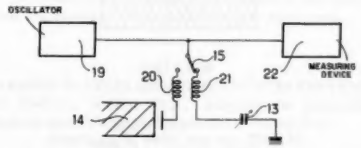
Ferdy Mayer, Grenoble, France, assignor to Laboratoire D'Electronique et D'Automatique Dauphinois, L.E.A.D., Grenoble, France, a part interest

Filed Nov. 24, 1972, Ser. No. 309,406

Claims priority, application Germany, Nov. 24, 1971, 2158320

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R **32 Claims**



A non-contact relative range measuring device for gauging the distance between a remote sensing device and an object. A remote sensing element and a reference sensing element are alternately connected to a source of signals capable of creating an electromagnetic field and a reference field, respectively. The two fields, when alternately created, also modify the signal from the signal source. The modified signal is applied to a measuring device capable of developing a measure of the difference in the modified signal due to the electromagnetic field and the reference field.

3,815,021

TWO THRESHOLD LEVEL DETECTOR USING A CAPACITIVE OR INDUCTIVE PROBE FOR SORTING

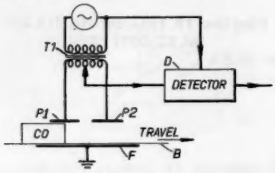
Bruce Goring Kerr, Windsor, England, assignor to Goring Kerr Limited, Berkshire, England

Filed Jan. 4, 1973, Ser. No. 321,036

Claims priority, application Great Britain, Jan. 6, 1972, 612/72

Int. Cl. G01r 27/26

U.S. Cl. 324—61 R 6 Claims



The specification discloses apparatus for sorting a succession of objects which are passed through a probe on a conveyor. The probes comprise one or two capacitors or inductances whose impedances are varied by the objects passing through. The probe is included in an a.c. bridge circuit whose output is detected by a phase sensitive detector. A discriminator is coupled to the detector by an a.c. coupling, to minimize drift. The discriminator discriminates relative to two threshold levels, the first corresponding to the presence of an object in the probe and the second corresponding to a minimum value of its magnetic or dielectric properties. Embodiments are disclosed in which the second threshold level is a peak amplitude (FIGS. 1 to 5), an integral (gross) magnitude (FIGS. 6 to 8) and an aggregate value of the time for which the instantaneous amplitude exceeds a third threshold (FIGS. 9 to 11).

3,815,022

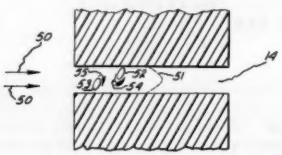
METHOD AND APPARATUS FOR MEASURING SMALL ASPHERICAL PARTICLES

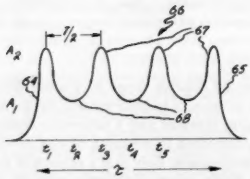
David C. Golibersuch, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1972, Ser. No. 294,921

Int. Cl. G01n 27/00

U.S. Cl. 324—71 CP 19 Claims





Method and apparatus for measuring size and asphericity of small aspherical particles is disclosed. Particles to be measured are urged through a long cylindrical pore whose diameter is greater than the largest major dimension of the particles expected and whose length is greater than several times its diameter. The suspending fluid, containing the small particles, in flowing through a long pore, exhibits a generally paraboloidal velocity profile. The variation in fluid velocity as a function of off-axis radial distance within the pore applies a shear moment to particles within the pore causing them to rotate. The resistance across the pore is measured in a conventional manner. In the case of spherical particles, rotation responsive to the fluid shear has no effect upon the resistive pulse output and measurements are performed as in the prior art. In the case of aspherical particles, on the other hand, the rotation caused by the fluid shear causes the observed resistance pulse across the pore to exhibit a plurality of relative maxima and minima. The major axis to minor axis ratio and the volume of the aspherical particles is determined from these relative maxima and minima.

3,815,023

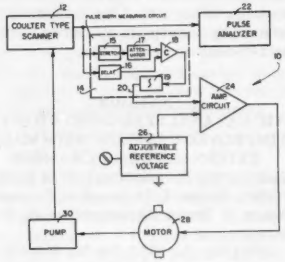
PULSE WIDTH STABILIZING METHOD AND APPARATUS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed June 18, 1973, Ser. No. 371,129

Int. Cl. G01n 27/00

U.S. Cl. 324—71 CP 12 Claims



A method and apparatus for stabilizing the widths of particle pulses produced by a Coulter type scanning aperture. The apparatus includes circuitry for sensing the widths of the particle pulses and a comparator for comparing each sensed width with a signal representative of a desired pulse width. Based upon the width comparison, an error signal is produced and coupled to control structure which varies the flow of particles through the scanning aperture, such that the error signal is reduced.

3,815,024

PARTICLE ANALYZER

Charles P. Bean, and Ralph W. De Blois, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

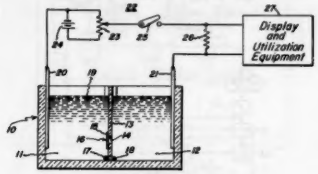
Continuation of Ser. No. 13,115, Feb. 20, 1970, abandoned. This application Feb. 23, 1972, Ser. No. 228,719

Int. Cl. G01n 27/00

U.S. Cl. 324—71 CP 5 Claims

An apparatus and method for electrophoretically driving solution-suspended small particles through a pore in a membrane and means for counting, sizing and characterizing the particles is disclosed. The apparatus comprises a container having two chambers fitted with electrodes, filled with an elec-

trolyte solution and separated by a partition having a membrane with a pore through which small particles are driven by



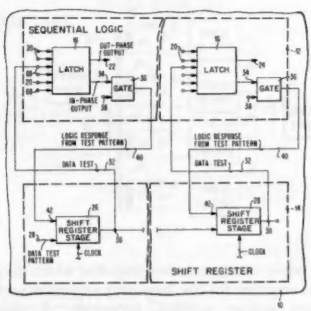
an electric field. The size, number and mobility of these particles is determined by appropriate apparatus.

3,815,025

LARGE-SCALE INTEGRATED CIRCUIT TESTING STRUCTURE

Paul Vincent Jordan, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1971, Ser. No. 190,025
Int. Cl. G01r *31/26*
U.S. Cl. 324—73 R **6 Claims**



A plurality of sequential logic circuits are connected to a shift register, both located on the same semiconductor chip. Input test data supplied at a chip input pad is routed via parallel paths interconnecting the sequential logic circuits to the shift register for performing combinatorial logic tests. The test responses are accessible to a chip output pad via the shift register. The shift register functions as virtual input/output pads so as to permit combinatorial logic testing on high density sequential logic circuits without increasing the actual input/output pad requirements of the semiconductor chip.

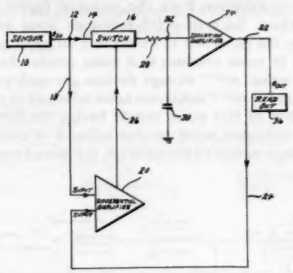
3,815,026

RADAR ALTIMETERS FOR AUTOMATIC LANDING SYSTEMS

Sidney Kraft, Bronx, N.Y., and Francis R. Preston, Le Lac Aurille, France, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 15, 1971, Ser. No. 88,354
Int. Cl. G01r *19/16*
U.S. Cl. 324—103 P **1 Claim**

An improvement on radar altimeters particularly as used in automatic landing systems where the altimeter will read only decreasing altitude and remain constant for increases in altitude caused by terrain variations, the result is accomplished by providing a lag network to allow the sensing of an increasing or decreasing altitude signal, an electronic switch is



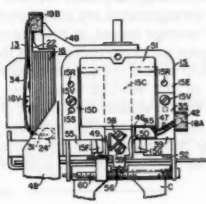
operated from the output of a differential amplifier cutting off the input on an increasing altitude signal. The altimeter is governed by an isolation amplifier controlled by the input signal and lag network.

3,815,027

DETACHABLE POTENTIAL INDICATOR CIRCUIT ASSEMBLY FOR INDUCTION WATTHOUR METERS

James E. Ramsey, Jr., Raleigh, and Auburn K. Griffin, Jr., Sanford, both of N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1973, Ser. No. 365,672
Int. Cl. G01r *11/02;* **G08b** *29/00*
U.S. Cl. 324—137 **9 Claims**



A detachable potential indicator circuit asembly for induction watthour meters includes an auxiliary winding coupled to the leakage flux of a meter coil for energizing a low power indicator lamp. In a preferred form, the assembly is self-contained on a mounting bracket which displays the lamp and positions the auxiliary winding adjacent the meter coil.

3,815,028

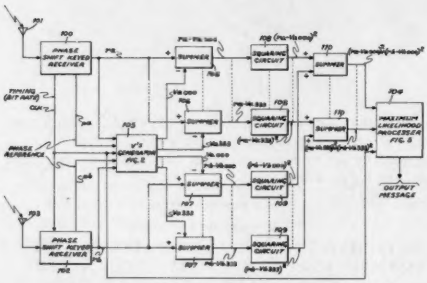
MAXIMUM-LIKELIHOOD DETECTION SYSTEM

Gerald Rabow, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 9, 1972, Ser. No. 279,119
Int. Cl. H04b *1/12*
U.S. Cl. 325—304 **8 Claims**

There is disclosed a system for simultaneously providing optimum equalization and optimum diversity combining for a digital signal transmitted through a dispersive medium by means of maintaining, updating and minimizing a set of noise residues. Each of $m^{(L-1)}$ storage means store a different one of $m^{(L-1)}$ digital message sequences capable of being received from the medium, where m is an integer greater than one equal to the number of symbols transmitted and L is an integer greater than one equal to the number of bit intervals over which there will be significant receiver response due to a

transmitted one of the m symbols. n receivers are provided for the digital signal, where n is an integer including one equal to the number of signal paths for the digital signal that has traveled through the dispersive medium which are referred to as "folds of diversity". A generator is coupled to the n receivers to generate from the received digital signal nm^L noise residues. Each of $m^{(L-1)}$ minimum noise selectors are coupled to the generator to detect in a different one of $m^{(L-1)}$ groups of m noise residues that noise residue having a first minimum value. $m^{(L-1)}$ storage devices are each coupled to a different one of $m^{(L-1)}$ minimum noise selectors to store the associated one of that noise resude having the first minimum value. A minimum noise residue selector is coupled to the $m^{(L-1)}$ storage device to detect from the stored noise residues



that noise residue having a second minimum value. A switching arrangement coupled to all the $m^{(L-1)}$ storage means responds to the noise residue having the second minimum value to provide one of the $m^{(L-1)}$ digital message sequences as an output digital message sequence for the detection system. $m^{(L-1)}$ switching arrangements are each coupled to a different one of the $m^{(L-1)}$ storage means, m predetermined ones of the $m^{(L-1)}$ storage means and a different one of the $m^{(L-1)}$ minimum storage selectors to update the message sequence stored in the associated one of the storage means by a predetermined number of bits of the message sequence in that one of the predetermined ones of the m storage means corresponding to the noise residue having the first minimum value in the associated one of the $m^{(L-1)}$ groups of m noise residues.

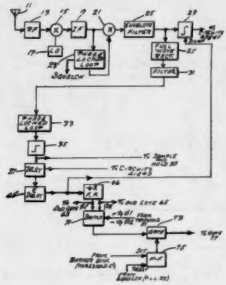
3,815,029

BURST PHASE SHIFT KEYED RECEIVER

Dennis L. Wilson, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 29, 1973, Ser. No. 327,360
Int. Cl. H04l 27/22
U.S. Cl. 325—320 **3 Claims**

A burst phase shift keyed receiver which detects, synchronizes and demodulates a phase shift key signal which has an additional 180° phase shift in the center of each transmitted bit. A two-stage sample and hold register is fed by the front end of the receiver and triggered at twice the bit rate, the output of each stage, in opposition to each other, are added, thereshold compared, gated with a delayed bit rate synchronizing signal and fed to a shift register that is enabled by a Barker code. The delayed bit synchronizing pulses are achieved by forming two sums of the outputs of the two stages of the sample and hold register, one sum being both the positive outputs and the other sum being the outputs of opposite phase. The two sums are full wave rectified and fed to a comparing threshold circuit, the output thereof feeding a pair of AND gates which are also fed by opposite phases of a divide-by-two flip-flop that is triggered by a delayed 2 times the bit rate signal. The AND gates trigger up or down a counter whose output is threshold detected and fed to a switch together with opposite phases of the flip-flop. The Barker code synchronizing signal is achieved by feeding the output of



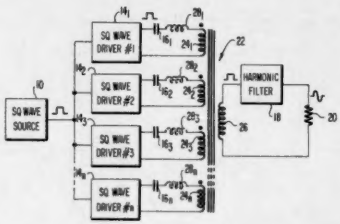
the front end to a threshold circuit, then to a serial in-parallel out shift register, adding the parallel outputs, full wave rectifying, and threshold detecting the sums.

3,815,030

SQUARE WAVE DRIVEN POWER AMPLIFIER

Heber J. Morrison, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 13, 1973, Ser. No. 379,156
Int. Cl. G06g 17/00
U.S. Cl. 328—27 **11 Claims**



A high power semiconductor amplifier which may be used as a power amplifier for low frequency apparatus such as radio transmitters and/or welding apparatus. A plurality of transistor driven amplifier sections are commonly driven by a square wave source and are coupled in parallel to a common load through loosely electro-magnetic coupled transformers or inductances forming the power combiner circuit. The loose coupling provides a desired low distributive capacitance and high leakage inductive reactance. Each amplifier driver section moreover is coupled to the transformer by a DC blocking capacitor having a selected capacitance value so that a series resonant circuit is formed with the combiner circuit leakage reactance near the center of the operating frequency band. Furthermore, the combiner circuit is coupled to the load by means of a harmonic filter having a series inductance input which acts to present a high reactive impedance to harmonics in the square wave voltage applied thereto so that a substantially sine wave of voltage and current is applied to the load.

3,815,031

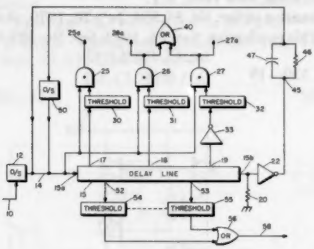
RECIRCULATING DELAY LINE DECODER-ENCODER

Ernest O. Kirner, Coral Springs, Fla., assignor to The Bendix Corporation, Ft. Lauderdale, Fla.

Filed Dec. 12, 1972, Ser. No. 314,297
Int. Cl. H03k 5/159
U.S. Cl. 328—56 **6 Claims**

A single delay line is used in an aircraft transponder for decoding interrogations and coding response thereto. The

various delay line output tap circuits respond only to signals having a predetermined polarity and a predetermined amplitude. Decoding is accomplished when certain of these output taps respond while coding is accomplished when certain others of the output taps respond.

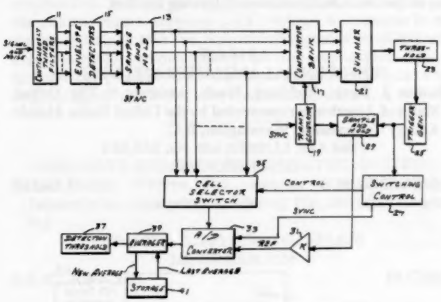


3,815,032

SELF NORMALIZING SPECTRUM ANALYZER AND SIGNAL DETECTOR

Jeffrey M. Parker, Houston, Tex.; Edward C. Dawson, Saratoga, and Anthony J. Kramer, Palo Alto, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 12, 1973, Ser. No. 369,385
Int. Cl. H03k *1/10*
U.S. Cl. 328—167 **3 Claims**



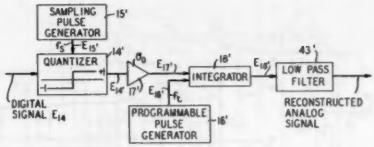
An analyzing system for detecting signals mixed with ambient noise. The desired signal with noise is fed to a bank of contiguously tuned filters which is followed by a bank of envelope detectors and then a bank of sample and hold circuits. A bank of comparators compare the values in the sample and hold circuits with the values in a ramp generator which is also fed to a ramp generator sample and hold circuit. The output of the comparator is summed, threshold detected, and fed to a trigger generator which triggers the ramp generator sample and hold circuit and also pulses a switching control circuit. The output of the ramp generator sample and hold circuit is scaled to become a reference signal and fed to an analog to digital converter. The outputs of the bank of sample and hold circuits are fed to a cell selector switch controlled by the switching control circuit and fed to the analog to digital converter. The switching control circuit also provides synchronizing pulses to the analog to digital converter, the bank of sample and hold circuits, and the ramp generator. The output of the analog to digital converter is averaged and threshold detected.

3,815,033

DISCRETE ADAPTIVE DELTA MODULATION SYSTEM

Stuart Keene Tewksbury, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 94,458, Dec. 2, 1970, Pat. No. 3,706,944. This application June 1, 1972, Ser. No. 258,529
Int. Cl. H03k *13/22*
U.S. Cl. 329—104 **13 Claims**



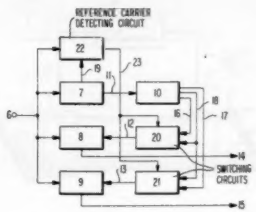
In a discrete adaptive delta modulation system, the modulator located at the transmitter converts an analog signal into a digital signal at the rate f_s while the demodulator located at the receiver converts the digital signal back into the analog signal. The modulator and demodulator each comprise a programmable pulse generator operating at the rate f_i for providing a controlled number of pulses k during each sampling period $1/f_s$ to its associated single stepsize analog integrator. The modulator further comprises a comparator, a quantizer, and a sampling pulse generator operating at the rate f_s while the demodulator further comprises a low-pass filter in series with the integrator. The number of pulses k provided by the programmable pulse generator multiplied by the integrator basic stepsize σ_o determines the overall stepsize σ_k in the integrator output signal, where $k = f_i/f_s$. A feature of this system is that the number n of available stepsizes σ_k, which is a function of the ratio of generator rates f_i and f_s, can be several hundred without affecting the complexity of the integrating circuitry.

3,815,034

DEMODULATOR FOR PHASE-MODULATED CARRIER WAVES

Kotaro Kato, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 28, 1972, Ser. No. 293,188
Claims priority, application Japan, Oct. 6, 1971, 46-78903
Int. Cl. H04l *27/22*
U.S. Cl. 329—104 **4 Claims**

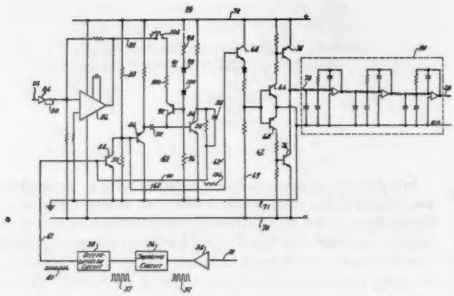


A demodulator for a multi-phase phase-modulated signal carrier wave having 2^m-phase phase-modulated bursts, m being a positive integer, and where each burst has at its leading end portion a 2^n-phase phase-modulated synchronizing signal, n being a positive integer smaller than m. The synchronizing signal of each burst is temporarily phase-demodulated by a 2^n-phase phase demodulator until the phase difference between the signal carrier wave and a reference carrier wave derived from the signal carrier wave is eliminated to permit demodulation of the remainder of the 2^m-phase phase-modulated burst.

3,815,035
TAPE SPEED COMPENSATION CIRCUIT

John H. Griffin, Racine, Wis., assignor to Marquette Electronics, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 265,266, June 22, 1972, abandoned. This application July 18, 1972, Ser. No. 272,770
Int. Cl. H03c 3/06; G11b 15/04
U.S. Cl. 329—136 7 Claims

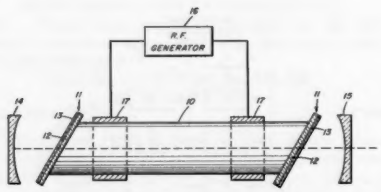


A demodulator of the one shot multivibrator type includes means for altering the operative period of the one shot multivibrator so as to compensate for flutter effects associated with a frequency modulated data signal. The means includes a current source for charging a capacitor controlling the operative period of the one shot multivibrator in accordance with a signal corresponding to flutter effects to provide the desired compensation.

3,815,036
INFRARED WINDOWS AND OPTICAL COATINGS FOR SAME DERIVED FROM CD_2SNO_4

Arthur Jack Nozik, 17 Guyer Rd., Westport, Conn. 06880

Continuation-in-part of Ser. Nos. 181,916, Sept. 20, 1971, and Ser. No. 181,915, Sept. 20, 1971, Pat. No. 3,773,914. This application Jan. 26, 1973, Ser. No. 327,057
Int. Cl. H01s 3/02
U.S. Cl. 330—4.3 4 Claims



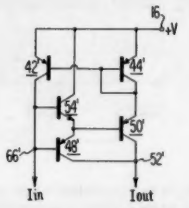
Cadmium stannate (Cd_2Sn0_4) is shown to provide an infrared transmitting composition when the electrical resistivity is maintained above 10 ohm-cm. by controlling the oxygen vacancy concentration of the material. Amorphous and crystalline films of Cd_2Sn0_4 can be disposed on light transmitting substrates and they exhibit high infrared transparency as well as providing protection against adverse atmospheric environments.

In particular, cadmium stannate of high electrical resistivity is shown to be useful as an optical window component (both as the window or as a coating for known windows) for use in high power gas phase lasers.

3,815,037
CURRENT TRANSLATING CIRCUITS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 56,534, July 20, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 309,025
Int. Cl. H03f 3/42
U.S. Cl. 330—19 15 Claims

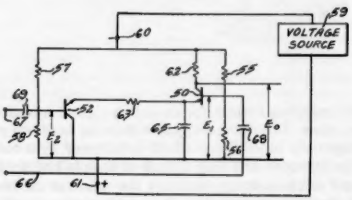


An amplifier suitable for integrated circuit construction including an active device current repeater load arrangement having relatively high output impedance, good frequency response, temperature stability and signal handling capabilities. The current repeater load arrangement includes a diode connected transistor and a further transistor having proportionally related conduction characteristics. A current amplifier comprising cascaded transistors is connected between the collector of the further transistor and the bases of the further transistor and the diode connected transistor. An additional, unidirectionally conducting device, poled to conduct as the first one of the cascaded transistors ceases conduction, is coupled from the collector of the further transistor to the input of one of the cascaded transistors following the first.

3,815,038
DIFFERENTIAL AMPLIFIER CIRCUITS

Thomas J. Davis, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 13, 1973, Ser. No. 350,861
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 4 Claims



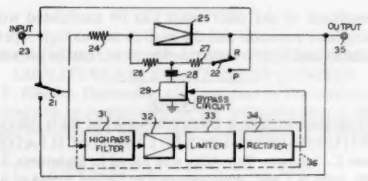
A differential amplifier circuit has two transistors of opposite polarity. The emitters of the two transistors are coupled in series by a resistor while a collector of one transistor is coupled to a voltage source by another resistor, equal in value to the first resistor, which will reverse-bias that collector. The collector of the other transistor is also coupled to a voltage source of different potential than the first source. The polarities of the voltage sources are chosen to reverse-bias the collector of each transistor. The input signals are applied to the base of each transistor. The output taken between the two collectors will be the difference between the inputs.

3,815,039

AUTOMATIC NOISE REDUCTION SYSTEM

Kiyoji Fujisawa, and Masao Tomita, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Apr. 14, 1972, Ser. No. 244,098
Claims priority, application Japan, Apr. 16, 1971, 47-4624650; Sept. 23, 1971, 46-4674374
Int. Cl. H03f 1/36
U.S. Cl. 330—51 10 Claims



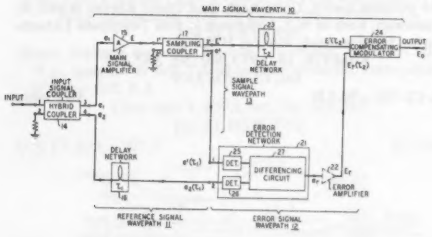
An automatic noise reduction system has a signal amplifier, a resistor as a first impedance circuit and a second impedance circuit which comprises resistors, capacitor and a variable resistance element. The frequency response of the second impedance circuit changes according to the resistance value of the variable resistance element and that resistance value is changed by a control circuit. In recording, the resistor constituting the first impedance circuit is connected to the input side of the signal amplifier and the second impedance circuit is connected to the negative feedback loop of the signal amplifier, and the control means provides a D.C. voltage in response to the input signal, so that the signal to be recorded is emphasized. In reproducing, the connection is reversed and the control means provides a D.C. voltage in response to the output signal, so that the reproduced signal is modified with characteristics complementary to the emphasized characteristics and provided with the same wave form as that of the original signal with reduced record medium noises.

3,815,040

FEED-FORWARD, ERROR-CORRECTING SYSTEMS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 2, 1973, Ser. No. 337,670
Int. Cl. H03f 1/28
U.S. Cl. 330—149 10 Claims



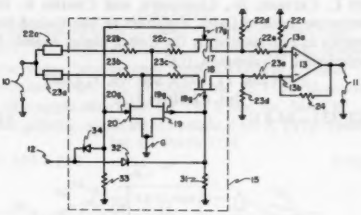
In a feed-forward, error-correcting system in accordance with the present disclosure, the error signal is formed by comparing the modulation component of the signal before and after signal processing. The error signal is then used to modulate the main signal so as to reduce the modulation error components introduced by the signal processing circuits.

3,815,041

AMPLIFIER CIRCUIT HAVING A MULTIPLICITY OF DISCRETE OPERATIVE STATES

Charles W. Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed June 14, 1972, Ser. No. 262,642
Int. Cl. H03f 21/00
U.S. Cl. 330—207 A 6 Claims



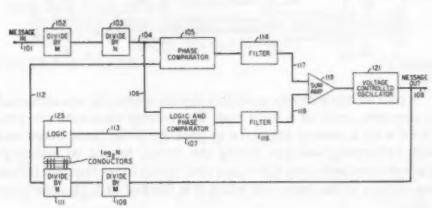
A controllable amplifier (or attenuator) having a plurality of operative states. In a first state, an amplifier control network energizes an amplifier in accordance with an input signal and a first gain control network to produce an output signal which is in phase with the input signal. In a second state, the amplifier control network energizes the amplifier in accordance with the input signal and a second gain control network to produce an output signal which is substantially 180° out of phase with the input signal. In a third or non-amplifying state, the amplifier control network prevents the generation of an output signal. The amplifier control network is adapted to be controlled by an externally generated control signal such as a signal indicating the dominant direction of voice transmission in a transmission line.

3,815,042

DUAL MODE PHASE LOCKED LOOP

Henry Ian Geoffery Maunsell, R.D. No. 1, Mountainside Dr., Colts Neck, N.J. 07722; John Brennan Millard, 23 Edgewood Dr., Matawan, N.J. 07747; John William Pan, 13 Parkway Pl., Holmdel, N.J. 07733, and John Jeffrey Schottle, 111 Harbor Green Cir., Red Bank, N.J. 07701

Filed May 21, 1973, Ser. No. 362,256
Int. Cl. H03b 3/04
U.S. Cl. 331—11 13 Claims



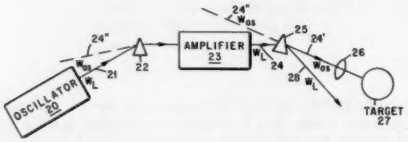
Input pulses and feedback pulses from a voltage-controlled oscillator are each divided by first and second factors. A first phase comparator, combined with a low-pass filter, affords a standard sawtooth-shaped voltage versus phase difference characteristic. Versions of the input and feedback pulse signals which are divided by the first and second factors are coupled to this first phase comparator. A logic circuit responsive to the pulses in the feedback circuit divided by both factors produces a distinctive pulse signal which is compared at a second phase comparator with the version of the input pulses divided by both the first and second factors. The second phase comparator, combined with a phase lag filter, produces a

transfer characteristic which is linearly increasing in a center range and which assumes constant values above and below that range. The filtered phase error signals are combined and coupled to the input of the voltage-controlled oscillator.

3,815,043
LASER SYSTEM EMPLOYING RAMAN ANTI-STOKES SCATTERING

Robert L. Carman, Jr., Livermore, and Charles K. Rhodes, Pleasanton, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 11, 1973, Ser. No. 322,642
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 G **3 Claims**

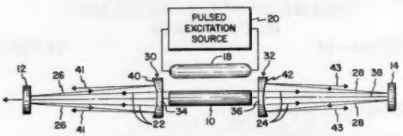


A laser system which employs a Raman anti-Stokes scattering process to produce high energy pulsed outputs of narrow pulsewidth and short wave-length, particularly useful in controlled fusion applications utilizing coherent optical pulses for plasma heating, and provides means for optically isolating the laser source from the laser system's target (the fusion plasma).

3,815,044
SOLID STATE LASER APPARATUS WITH AUXILIARY INTRA-CAVITY MIRROR ELEMENTS

William R. Hook, Los Angeles; Roland H. Dishington, Pacific Palisades, and Ronald P. Hilberg, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 5, 1973, Ser. No. 329,652
Int. Cl. H01s *3/08*, *3/05*
U.S. Cl. 331—94.5 C **5 Claims**



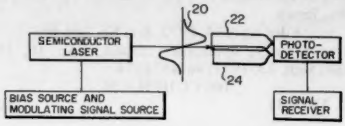
A pair of intra-cavity auxiliary mirror elements are mounted at opposite ends of a laser rod. The mirror elements are provided with a central aperture to pass the main laser beam and with reflecting surfaces facing the cavity mirror to intercept and recover and stray light rays that result from thermal focusing effects in the laser rod when it is flashed at high repetition rates.

3,815,045
METHOD OF AND DEVICE FOR MODULATING DIRECTLY A SEMICONDUCTOR LASER

Ryoichi Ito, Hino, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 6, 1972, Ser. No. 295,655
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 M **16 Claims**

A method of modulating directly a semiconductor laser such that a laser beam of one mode-order emitted from the semiconductor laser is converted into that of another mode-order by a pulse current superposed on a bias current flowing through the semiconductor laser and one of said two mode-orders is transmitted selectively through an optical guide, so that

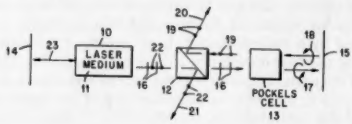


the amplitude of the laser beam can be modulated without stopping laser emission and the modulation at high repetition frequencies and with low modulating power can be obtained.

3,815,046
SYNCHRONOUSLY DRIVEN Q-SWITCHED OR Q-SWITCHED-MODE-LOCKED LASER OSCILLATOR

Bertram C. Johnson, Palo Alto, and Lloyd L. Steinmetz, Livermore, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 7, 1973, Ser. No. 330,523
Int. Cl. H01s *3/11*
U.S. Cl. 331—94.5 **5 Claims**

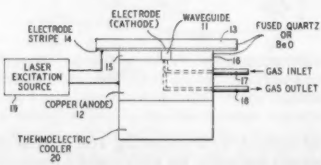


A laser oscillator for producing relatively long duration Q-switched or Q-switched/mode-locked bandwidth-limited pulses. The oscillator is self-driven and then synchronously gated at the cavity round trip time, whereby a large pulse of noise light of controllable duration is allowed to build-up by means of controlled bandwidth feedback. The oscillator is an improvement over that described and claimed in copending U. S. Pat. application Ser. No. 226,471, filed Feb. 15, 1972, and assigned to the same assignee. A factor of ten or more improvement in energy per pulse has been achieved while preserving both the desired bandwidth limited character of the pulses and the range of realizable pulse-widths provided by the oscillator of the above-mentioned application.

3,815,047
TRANSVERSELY-EXCITED WAVEGUIDE GAS LASER

Peter William Smith, Colts Neck, and Obert Reeves Wood, II, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 14, 1973, Ser. No. 332,277
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 R **10 Claims**



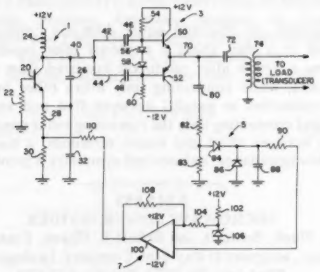
There are disclosed various configurations for waveguide gas lasers operating at high total gas pressures to enable a broad tuning band and with a transverse excitation structure

that reduces the threshold and waste heat generation of the laser. This structure typically includes a smooth base anode and cathode squares plated on a dielectric that forms an opposed wall of the waveguiding structure. Multiple gas inlets and outlets are also preferably provided along the bore; and the pulse-forming capacitors can be formed integrally with the cathodes by plating a common electrode over the dielectric support of the cathodes. Optionally, the anode may be cooled thermoelectrically because of the small heat generation per unit length. A variety of pre-ionization techniques, including a multiplicity of plasma-jets, are also disclosed.

3,815,048
LC-OSCILLATOR WITH AUTOMATIC STABILIZED AMPLITUDE VIA BIAS CURRENT CONTROL

John F. Hamlet, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 15, 1973, Ser. No. 370,505
Int. Cl. H03b *3/02*
U.S. Cl. 331—109 **6 Claims**

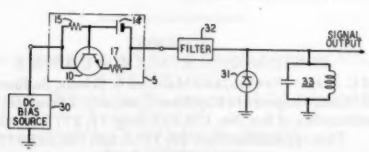


A stable excitation supply for transducers having a single-transistor oscillator with a coil connected to the collector and a capacitor connected from the collector to the emitter. The base is connected through a resistor to ground. The output of the oscillator transistor is connected to a buffer circuit of two transistors of opposite conductivity type. That output is connected to a standard rectifier and then as one input to a differential amplifier. The output of the differential amplifier is connected to a resistor which is connected between the emitter of the oscillator transistor and ground.

3,815,049
NEGATIVE RESISTANCE OSCILLATOR WITH ACTIVE BIAS RESISTOR FOR PREVENTING SPURIOUS OSCILLATIONS

Henry Richard Beurrier, Chester Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 9, 1973, Ser. No. 349,395
Int. Cl. H03b *7/06*
U.S. Cl. 331—107 R **10 Claims**

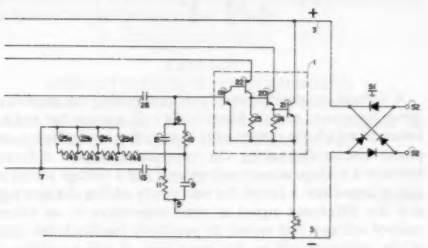


This application describes an active resistor which presents a high resistance, $\Delta E/\Delta I$, to alternating current signals while presenting a much lower resistance, E/I, to direct current. The resistor is a two-terminal device including a transistor whose emitter is connected to one terminal and whose collector is connected to the other terminal. A parallel conductive path, to which the transistor base is connected, includes means for maintaining a controlled emitter-base bias. The device is specifically intended for use in IMPATT diode bias circuits.

3,815,050
TEMPERATURE STABLE TONE GENERATOR

Michael C. J. Cowpland, Ottawa, Ontario, Canada, assignor to Microsystems International Limited, Ontario, Canada

Continuation of Ser. No. 117,400, Feb. 22, 1971, abandoned. This application Mar. 23, 1973, Ser. No. 344,238
Claims priority, application Canada, Feb. 5, 1971, 104609
Int. Cl. H03b *5/26*
U.S. Cl. 331—110 **9 Claims**

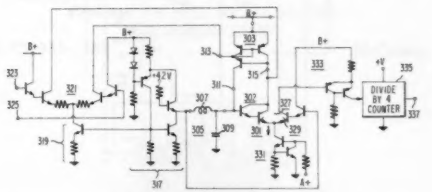


A temperature stable tone oscillator having advantageous application as a dialing oscillator in telephone sets. An emitter-follower uses a parallel T, R-C filter with greater than unity gain in its feedback loop; a temperature stable clipper limits the signal so as to keep the emitter-follower out of saturation, while additional circuits compensate for temperature variation of the operating point of the emitter-follower, feed large amounts of current to the clipper and its reference source with a small voltage drop, etc; the tone oscillator can thus be used with very low supply voltages.

3,815,051
CONTROLLED OSCILLATOR

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,364
Int. Cl. H03b *3/04, 5/12*
U.S. Cl. 331—117 R **7 Claims**



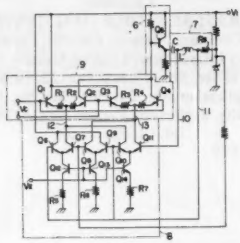
A controlled oscillator having an anti-resonant tank circuit tuned by an admixture of an adjustable portion of quadrature current responsive to oscillation signals appearing across the tank circuit. The adjustable portion of quadrature current is provided by adjustably splitting a fixed quadrature current into first and second fractions in a current splitter in response to a control signal, then subtracting the first fraction from the second to obtain a difference current which is applied to the tank circuit.

3,815,052

VOLTAGE CONTROLLED OSCILLATOR

Yoshizumi Watatani, Machida, and Katsuo Mohri, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1973, Ser. No. 327,688
Claims priority, application Japan, Jan. 28, 1972, 47-9865
Int. Cl. H03b 5/12
U.S. Cl. 331—117 R 12 Claims



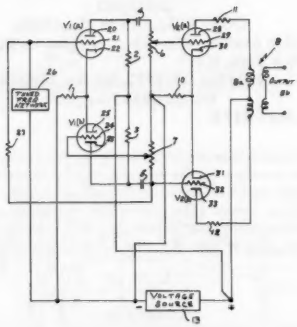
A voltage controlled oscillator comprising an amplifier, a series resonance circuit, formed of a coil, a capacitor and a resistor, to which the output of said amplifier is supplied, a composite circuit for taking the vectorial sum and difference between a voltage across said resistor and a voltage across said coil or capacitor, a circuit for vectorially adding the sum signal and the difference signal at rates responsive to an external control voltage, and means to positively feedback the output of the adder circuit to the input side of said amplifier, the phase of said output of said adder circuit being changed in response to said external control voltage, to make the oscillation frequency of said oscillator variable.

3,815,053

STABLE SIGNAL GENERATOR

Laurence E. Orne, 4 Eubar Cir., Billerica, Mass. 01821

Filed Jan. 16, 1973, Ser. No. 324,018
Int. Cl. H03b 5/10
U.S. Cl. 331—168 2 Claims



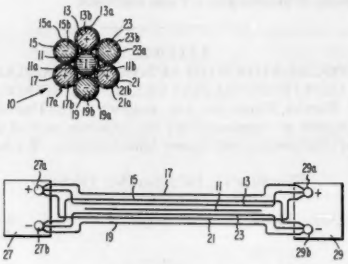
A stable signal generator providing a signal of preselected frequency regardless of variation of the output impedance. The signal generator includes a tuned network associated with a first balanced amplifier. A second balanced amplifier receives the output signal from the first balanced amplifier and provides a stable frequency output signal. The first balanced amplifier is cathode coupled to the tuned frequency network with positive feedback from one of the outputs of the first balanced amplifiers to provide the requisite phase and amplitude signal for oscillation purposes.

3,815,054

BALANCED, LOW IMPEDANCE, HIGH FREQUENCY TRANSMISSION LINE

Donald Avery McClure, Pennsauken, and Harvey Clay Nichols, Barnsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 27, 1973, Ser. No. 383,110
Int. Cl. H01p 5/00
U.S. Cl. 333—5 9 Claims



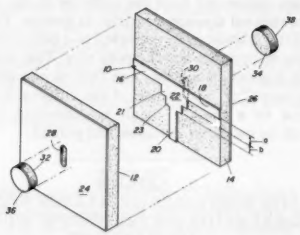
A plurality of insulated equal diameter conductors are clustered in a ring about a centered idler conductor. By providing a center idler conductor insulated from the outer conductors, while connecting only every other one of the outer conductors in parallel between first and second terminals and connecting only the remaining outer conductors in parallel between third and fourth terminals, a transmission line of low impedance, balance and symmetry is provided.

3,815,055

MICROWAVE POWER DIVIDER

Troy E. Plunk, Bedford, and Robert L. Moran, Franklin, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 20, 1973, Ser. No. 353,170
Int. Cl. H01p 3/08, 5/12; H03h 7/38
U.S. Cl. 333—9 5 Claims



A stripline power divider is disclosed wherein three center conductors are joined at a common junction and the ground planes have slots formed therein adjacent to the common junction. Reflections resulting from mismatched impedances terminating a pair of the center conductors radiate through the slots. A load material is disposed over the slots to absorb any such radiating reflections.

3,815,056

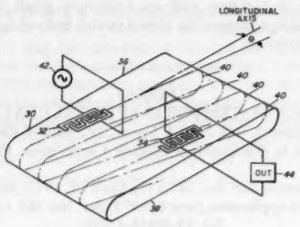
CONTINUOUS SURFACE WAVE DEVICE

Paul C. Meyer, Newton, and Manfred B. Schulz, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 170,937, Aug. 11, 1971, abandoned.
This application Mar. 29, 1973, Ser. No. 345,937
Int. Cl. H03h 9/30
U.S. Cl. 333—30 R 17 Claims

A surface wave structure such as a surface acoustic wave delay line in which the surface is curved such that surface

waves continue on the surface until absorbed by the losses in the structure which may be a quartz crystal, thereby greatly increasing the total delay time available with a limited amount of material.



3,815,057

DEVICE FOR MONITORING CONTROL ELEMENTS

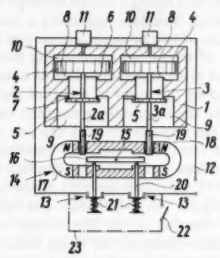
Kurt Stahle, Steinegg, Germany, assignor to Concordia Maschinen- und Elektrizitats-GmbH, Stuttgart, Germany

Filed Jan. 26, 1973, Ser. No. 327,165

Claims priority, application Germany, Jan. 25, 1972, 2203266

Int. Cl. H01h *9/00*

U.S. Cl. 335—1 **23 Claims**



Device for monitoring the relative position of synchronously moved control elements, especially for monitoring the movement of two valve cases in safety valves controlling a pneumatic or hydraulic drive. The device includes a magnetic member disposed at each of the valve cases and symmetrically arranged with respect to one another, a rotatably mounted magnetic bar having each of the magnetic members arranged proximate to a free end thereof for magnetically influencing the positioning thereof. Spring forces and magnetic forces are effective on the bar so as to provide the bar with a first basic stable position corresponding to synchronous movement of the valve cases and two stable disturbance positions corresponding to asynchronous movement of the valve cases.

3,815,058

SHUNT TRIP DEVICE WITH INTEGRALLY MOUNTED AUXILIARY SWITCH

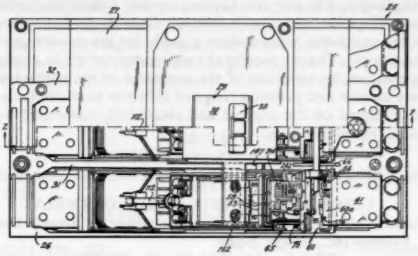
Paul Stetsuk, Philadelphia, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed May 3, 1973, Ser. No. 356,828

Int. Cl. H01h *83/00*

U.S. Cl. 335—8 **10 Claims**

A multipole molded case circuit breaker is provided with a subassembly that includes a shunt trip device and a switch for opening the energizing circuit for the operating coil of the shunt trip electromagnet after opening of the circuit breaker.



This subassembly is disposed in a single housing compartment that houses one pole of the circuit breaker.

3,815,059

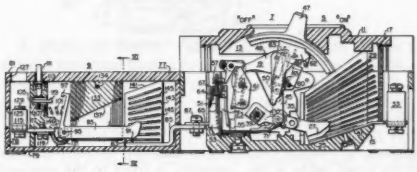
CIRCUIT INTERRUPTER COMPRISING ELECTROMAGNETIC OPENING MEANS

Leonard A. Spoelman, West Lafayette, Ind., assignor to Westinghous Electric Corporation, Pittsburgh, Pa.

Filed Dec. 1, 1972, Ser. No. 331,077

Int. Cl. H01h *77/10*

U.S. Cl. 335—16 **18 Claims**



A circuit interrupter is constructed to utilize the electromagnetic forces generated by an overload current condition in order to drive a movable contact arm to open the contacts of the interrupter.

3,815,060

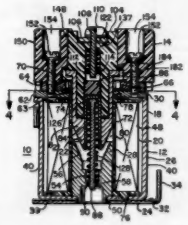
ELECTROMAGNETIC CONTACTOR FOR BATTERY POWERED VEHICLES

Merlin Y. Turnbull, Brookfield, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed Apr. 19, 1973, Ser. No. 352,767

Int. Cl. H01h *50/20*

U.S. Cl. 335—133 **10 Claims**



A compact contactor for a battery operated lift truck. The contactor may be mounted in either of two positions and has

its terminals arranged so it can be easily connected in a reversing circuit for a motor. The contactor includes a novel movable contact support which is molded in situ with a magnet plunger. The movable contact support completely isolates the springs for the movable contacts from the switching areas of the contactor and provides a guide for the movements of the plunger. The support for the stationary contact is arranged to position the terminals of the contactor so the contactor is easy to wire and permit a range of different sized contacts to be mounted on the support and electrically connected by a pair of metal members.

3,815,061

AUTOMATIC CONTROL CABLE ASSEMBLY

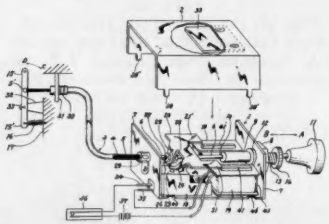
Fumio Fujio, Nishinomiya, Japan, assignor to Nippon Cable Systems Inc., Hyogo, Japan

Filed Jan. 26, 1973, Ser. No. 326,788

Claims priority, application Japan, Sept. 11, 1972, 47-91082; Dec. 1, 1972, 47-120871

Int. Cl. H01h *47/04*

U.S. Cl. 335—145 **7 Claims**



An automatic control cable assembly for operating various engine mechanisms of automobile, ship and other industrial machines, by remote control. The assembly is constructed so that an inner cable in the assembly is fixed to the operated position until the conditions required in the various engine mechanisms are satisfied, and said inner cable is automatically restored to its original position when the above conditions are satisfied.

3,815,062

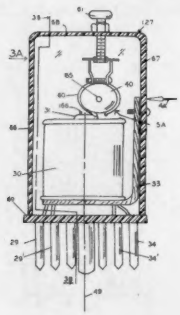
VOLTAGE MONITORING SYSTEM AND PROCESS

Melvin O. Allen, 1408 Fourth Ave., Canyon, Tex. 79015

Continuation of Ser. No. 171,862, Aug. 16, 1972, abandoned. This application Mar. 30, 1973, Ser. No. 346,262

Int. Cl. H01h *51/28*

U.S. Cl. 335—152 **6 Claims**



Voltage monitoring circuits and components including a coil and electromagnetic core and a reed sensor with the core operated at a very low degree of magnetic saturation and a very small reed switch gap. The reed switch is adjustably located in the magnetic field of the coil and core to provide a highly sensitive as well as adjustable voltage sensing and monitor circuit and action with an extremely small difference between voltage to open the closed circuit and voltage to close the opened circuit.

3,815,063

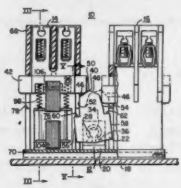
INTERLOCK SYSTEM FOR ELECTRICAL CONTACTORS

Kurt A. Grunert, and John J. Dauer, Jr., both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 247,171, April 24, 1972, abandoned. This application June 8, 1973, Ser. No. 368,146

Int. Cl. H01h *33/46*

U.S. Cl. 335—160 **5 Claims**



An interlock system for two or more electrical contactors in which the contactors each comprise a movable contact structure associated with electromagnetic means for actuating the movable structure for closing a circuit through the contactors, the movable contact structure including a movable contact carrier, the carriers of two adjacent contactors being movable in parallel paths of travel; an interlocking member between the contactors and pivotally mounted on an axis perpendicular to a plane defined by the paths of travel of the movable contact structures and the interlocking member having camming surfaces engageable respectively with the end portions of the movable contact structures and the interlocking member being movable by one of the movable contact structures into the path of travel of the other movable contact structure. The system also includes an electrical interlock detachably mounted on the housing of the device and comprising stationary and movable contacts and being interconnected with the movable contacts of the movable contact carrier of said device.

3,815,064

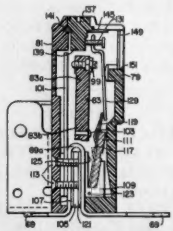
CIRCUIT INTERRUPTER PROTECTIVE DEVICE

Alfred E. Maier, Beaver Falls, and William I. Stephenson, Jr., Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1973, Ser. No. 345,394

Int. Cl. H01h *71/74*

U.S. Cl. 335—176 **9 Claims**



A circuit interrupter protective device responsive to abnormal currents in conductors of an electrical distribution system

characterized by a circuit breaker within a first insulating housing and having a mechanism for opening and closing separable contacts which mechanism comprises a releasable member movable from latched to unlatched positions, trip means comprising a stationary magnetic structure for each conductor as well as a coil and core assembly and armature therefor, a trip bar movable to unlatch the circuit breaker mechanism and biased in the latched position, lever means associated with the stationary magnetic structure for moving the trip bar to the unlatched position, the lever means comprising the armature and being movable in response to abnormal currents in at least one of the conductors, the lever means being biased away from the core assembly, and means for adjusting the spacing between the lever and core assembly.

3,815,065

MAGNETIC ARMATURE FOR MAGNETIC ARRANGEMENTS SUBJECT TO IMPACT STRESSES

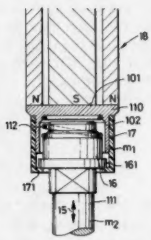
Wilhelm Hadam, Bellinostr. 115, 7410 Reutlingen, Germany

Filed Dec. 11, 1972, Ser. No. 313,692

Claims priority, application Germany, Dec. 10, 1971, 2161377

Int. Cl. H01f 7/08

U.S. Cl. 335—257 **9 Claims**



A magnetic armature particularly adapted for use with magnet devices which are subject to impact, such as, electro-retaining magnets for knitting machines, includes a magnetic armature head of relatively small mass which is resiliently connected to a magnetic armature body of larger mass. The resilient connection can be provided by a spring or by an intermediate member such as a rubber connector rigidly secured to both the armature head and body.

3,815,066

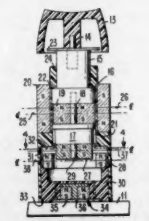
MAGNETIC KEY MECHANISM OR THE LIKE

Albert W. Vinal, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 19, 1972, Ser. No. 263,831

Int. Cl. H01f 7/02

U.S. Cl. 335—306 **8 Claims**



A key mechanism has co-axial permanent magnets as a biasing means for key operator and co-axial permanent magnets operable to cause snap action operation of a cylindrical cup within a housing. The co-axial biasing magnets are magnetized in parallel to their common axis and have a polarity of opposite direction. The actuator permanent magnets are magnetized in parallel with their common axis and have a polarity in the same direction. The force-displacement characteristic of the biasing magnets is matched to the force-displacement characteristic of the actuator magnets to provide a predetermined tactile force-displacement characteristic for the operator.

3,815,067

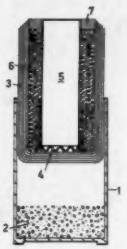
CHOKES OR REACTORS

Chew Seng Koh, 108 Joo Chiat Terrace, Singapore, Singapore (15)

Filed Aug. 4, 1972, Ser. No. 278,125

Int. Cl. H01f 17/04, 27/24

U.S. Cl. 336—83 **11 Claims**



A choke or reactor has laminations which define a U-shaped structure having two outer limbs and a base. Further laminations define a central limb connected at one end to the base and surrounded by a winding. In some embodiments the free ends of the outer limbs and the central limb are connected by laminations disposed between them. The central limb, at the said one end, may be separated from the base by an air gap.

3,815,068

STATIONARY INDUCTION APPARATUS

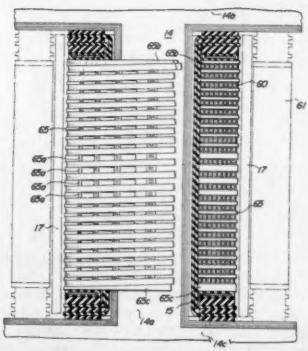
Yasuro Hori; Kiyoto Hiraishi; Tadashi Kiuchi, and Yoshitake Kashima, all of Hitachi, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 794,862, Jan. 29, 1969, abandoned. This application July 14, 1971, Ser. No. 162,491

Claims priority, application Japan, Jan. 31, 1968, 43-5419

Int. Cl. H01f 27/33

U.S. Cl. 336—100 **22 Claims**



A stationary induction apparatus having a plurality of windings concentrically disposed around a leg portion of an

iron core. In the apparatus, the distribution of ampere-turns in the axial direction within an inner one of the windings is reduced at substantially equally spaced intervals to vary the vibration mode of the winding so as to prevent the winding from resonating at the power source frequency and its harmonics and to reduce the electromagnetic force developed in the axial direction of the winding due to a short-circuit current flowing through the winding in the event of a short-circuit occurring in a system to which this apparatus is connected and due to leakage flux appearing in the apparatus.

3,815,069

PROCESS FOR THE MANUFACTURE OF ELECTRICAL COILS

Mario Palazzetti; Bruno Cavallarin, and Giovanni Villa, all of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Jan. 14, 1972, Ser. No. 217,835
Claims priority, application Italy, Jan. 28, 1971, 67287/71
Int. Cl. H01f *5/00*
U.S. Cl. 336—200 **2 Claims**

This invention concerns a process for making an electrical coil without winding in which an insulating support is moulded, preferably in plastics, with a helical surface groove. The grooved surface of the support is metallised, and subsequently ground to remove the crests between adjacent turns of the groove, leaving a helical metal layer in the groove, constituting a coil. The insulating support may have any desired shape.

3,815,070

CIRCUIT BREAKER WITH WIDE OPENING CONTACTS

John DeTorre, Albemarle, N.C., assignor to Federal Pacific Electric Company, Newark, N.J.

Filed Dec. 22, 1972, Ser. No. 317,754
Int. Cl. H01h *71/16*
U.S. Cl. 337—59 **4 Claims**

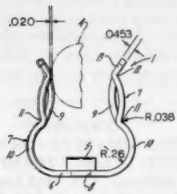
The circuit breakers involved are of the type having a contact arm pivoted between its ends and operable by a manually erected toggle for closing the contacts. A bell-crank, pivoted to one end of the contact arm, has a latch arm restrained by an over-current latch also carried by the contact arm. That type of circuit breaker is given increased interrupting capability by modification of its component parts, especially the handle and the linkage operated by the handle, to produce greatly increased contact separation.

3,815,071

FUSE CLIP

Michael Roy Sleeter, Rudolph, Ohio, assignor to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed Dec. 8, 1972, Ser. No. 313,578
Int. Cl. H01h *85/50*
U.S. Cl. 337—215 **2 Claims**



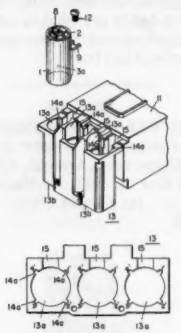
A single piece metal fuse clip having a flat base and a pair of longitudinally spaced resilient arms having an outwardly curved upper portion and outwardly curved lower portion both of which extend inwardly to meet at a juncture at which the radius is of lesser thickness than the metal of the clip and to effect holding of a fuse in the upper portion of the clip. The lower portion of each arm of the clip curves gradually outwardly from the base of the clip on a radius greater than at least three times the thickness of the metal of the clip. The overtravel of the clip at the fuse entry end of the clip is less than 0.030 inches.

3,815,072

FUSE AND HOLDER WITH REJECTION FEATURE

Bernard Di Marco, 1116 Milligan, Bellefontaine, Ohio 43311; Kenneth W. Swain, P.O. Box 37, Hampton Falls, N.H. 03844, and Andrew J. Kralik, 911 Sherwood, Marysville, Ohio 43040

Filed Jan. 16, 1973, Ser. No. 324,193
Int. Cl. H01h *85/24*
U.S. Cl. 337—226 **6 Claims**



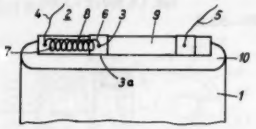
A fuse holder substantially in the shape of a tubular receptacle intended for insertion into it of a cartridge fuse having plug terminals, and the fuse itself inserted into it, are provided with cooperating rejection means for precluding insertion of an improper fuse into the receptacle. To this end the receptacle is provided with at least one internal groove extending in a direction longitudinally thereof and the fuse is provided with at least one radial pin the outer end of which projects beyond the casing of the fuse and into the aforementioned internal groove in said receptacle.

3,815,073

ELECTRICAL FUSE

Franz-Josef Pollmeier, and Paul Muller, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 12, 1972, Ser. No. 296,749
Claims priority, application Germany, Oct. 21, 1971, 2153012
Int. Cl. H01h 85/04
U.S. Cl. 337—295 8 Claims



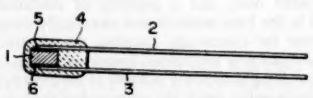
A fuse for protecting high voltage circuit elements, particularly capacitor units, the fuse elements including a conductive fuse wire wound in a helical configuration and enclosing thereby a hollow core. In a preferred embodiment, the coiled helix has a length which is approximately half the total length of fuse wire therein.

3,815,074

THERMISTOR FOR TEMPERATURE MEASUREMENT

Yasushi Nagata, Urawa, Japan, assignor to Shibaura Electronics Co., Ltd., Urawa, Japan

Filed Jan. 22, 1973, Ser. No. 325,655
Claims priority, application Japan, May 2, 1972, 47-43274
Int. Cl. H01c 7/04
U.S. Cl. 338—22 R 3 Claims



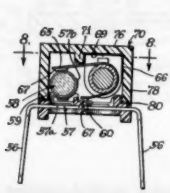
Thermistors for temperature measurement and method of making the same, wherein the yield in the manufacture is very high and the choice of the products can be made in the midway of the manufacture so that small-sized thermistors having little change in the resistance for the long use can be obtained inexpensibly, said thermistors being usable at a high temperature.

3,815,075

TRIMMER POTENTIOMETER

Samuel Andrew Johnston, Fontana, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 3, 1971, Ser. No. 195,410
Int. Cl. H01c 1/08
U.S. Cl. 338—159 19 Claims



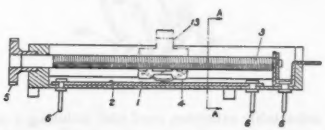
A trimmer potentiometer of dual in-line character including a lead frame molded in an insulating envelope with extensions of the lead frame extending beyond the envelope forming heat and electrical conductive leads; the envelope is provided with openings for exposing contact areas of the lead frame for securement of elements of the electrical circuit of the potentiometer; the lead frame forms a heat sink for the electrical circuit elements, with the heat being dissipated through the leads; in the fabrication of the device, the lead frames of a plurality of the devices are included in a continuous strip which is cut to form the separate lead frames in a continuous operation in which the lead frames are molded in the envelopes.

3,815,076

ROTARY DRIVEN VARIABLE RESISTOR

Masatsugu Aoki, Soma, Japan, assignor to Alps Electric Co. Ltd., Tokyo, Japan

Filed May 21, 1973, Ser. No. 362,351
Claims priority, application Japan, May 19, 1972, 47-58509
Int. Cl. H01c 9/02
U.S. Cl. 338—180 7 Claims



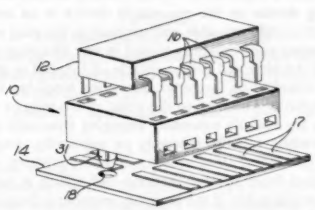
A rotary driven variable resistor comprises a casing, a screw-threaded shaft rotatably mounted in the casing, a resistance element disposed longitudinally in the casing, and a sliding contact positioned in the casing and on the resistance element. The sliding contact is made of a resilient metal plate and is formed into an upper surface plate and a contact plate integrally connected together. The upper surface plate has a reversed channel configuration and is partly cut out to provide a centrally located projection engageable with the screw-threaded shaft. The contact plate is bent back downwardly and formed into an inverted chevron shape with at least one contact formed on the rear side of the apex portion, so that when a free end of the contact plate resiliently abuts an end of the upper surface plate, a well balanced spring force is applied to the contact.

3,815,077

ELECTRICAL CONNECTOR ASSEMBLY

John W. Anhalt, and David S. Goodman, both of Orange, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

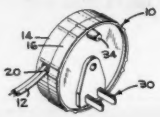
Filed Feb. 28, 1973, Ser. No. 336,606
Int. Cl. H01r 23/02; H05k 1/04
U.S. Cl. 339—17 CF 13 Claims



An electrical connector assembly for interconnecting an electrical circuit element having a plurality of electrical leads extending therefrom with a printed circuit board having conductive strips thereon. The connector assembly comprises an insulated housing which is releasably mounted on the board and contains a plurality of compartments each receiving an

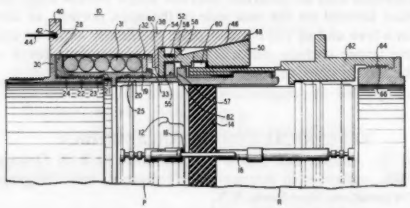
electrical contact. Slots are formed in the upper wall of the housing for receiving the electrical leads of the electrical circuit element while apertures are formed in the lower wall thereof. Each contact has the general configuration of the numeral "9." The lower curved portion of the contact extends across the aperture in the housing to contact a conductive strip on the printed circuit board. The free end of the lower curved portion of each contact extends into a recess in the wall of the housing to retain the contact therein.

3,815,078
RETRACTABLE EXTENSION CORD UNIT
Nicolas W. Fedrick, 155 Acalames Dr., Sunnyvale, Calif. 94040
Filed Aug. 31, 1972, Ser. No. 285,452
Int. Cl. H01r *11/00*
U.S. Cl. 339—28 R **2 Claims**



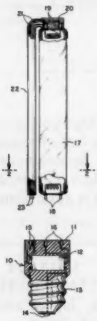
A retractable extension cord unit including a small housing within which the cord can be stored but formed from two relatively rotatable members whose rotation enables selected extension or retraction of the cord.

3,815,079
ELECTRICAL CONNECTOR
Mark Auriana, Springdale, Conn., assignor to Burndy Corporation, Norwalk, Conn.
Filed Dec. 29, 1972, Ser. No. 319,141
Int. Cl. H01t *13/62*
U.S. Cl. 339—46 **5 Claims**



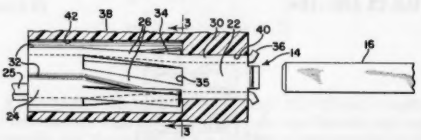
A quick disconnect electrical connector having a plug device and a receptacle device. Fixedly connected to either the plug device or the receptacle device is an outer sleeve structure axially movable with respect to the plug or receptacle member and resiliently biased in one direction of engagement of the plug and the receptacle. A lanyard or other structure is attached to the outer sleeve for receiving the disconnecting force. Attached to the other of the plug or receptacle devices are radially extending engaging structures which can be extending radially inwardly or outwardly. Engaging the radially extending structures is a coupling member which may be formed from several sections and which is radially outwardly expandable. If the coupling member is formed in a plurality of sections, it has a retaining mechanism adjacent to the end nearest the outer sleeve member. A coupling member has a radially and circumferentially extending structure to engage the radially extending structure on either the plug or receptacle means. Both the outer sleeve member and the coupling member have chamferred axially extending surfaces. The outer sleeve member on its internal surface on one end and coupling member on its outer surface. An inner circumferential surface near one end of the coupling member is tapered or chamferred to permit the expandable coupling member to pivot outwardly away from the plug or receptacle member. Each coupling member segment is self-aligning and mutually abutting. Each coupling member segment has a single complete track and detent.

3,815,080
FLUORESCENT LAMP ADAPTER ASSEMBLY
Frank Summa, 22 Starbuck St., Staten Island, N.Y. 10304
Filed Apr. 12, 1973, Ser. No. 350,422
Int. Cl. H01r *13/66*
U.S. Cl. 339—52 R **1 Claim**



An adapter assembly for coupling a standard fluorescent lamp to an incandescent lamp fixture socket, comprising a base member having a lower threaded portion for disposal in the fixture socket, a ballast transformer electrically coupled to the threaded base, and a plurality of electrical contacts disposed in the base member and electrically coupled to the transformer for electrically coupling the electrodes of the fluorescent lamp to the ballast transformer. One end of the fluorescent lamp is disposed in a pair of the electrical contacts in the base member, while the other end of the tube is electrically coupled to the ballast transformer by a cap slidably disposed over the end of the lamp which includes electrical contacts coupled by elongated wires in an elongated tube disposed adjacent the lamp to another pair of contacts in the base member. The adapter assembly permits the insertion of a standard fluorescent lamp in an incandescent lamp socket fixture without modification.

3,815,081
ELECTRICAL CONNECTOR
Chesley Jones, Westlake Village, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 2, 1973, Ser. No. 356,651
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 S **12 Claims**



A female electrical contact member having a noncircular socket passage therethrough and adapted to receive a male member with a similar noncircular cross-sectional configuration. The female contact member includes a plurality of

twisted beams having internal tracking surfaces which are adapted to exert a torsional force on the associated male contact as it is inserted through the passage.

3,815,082

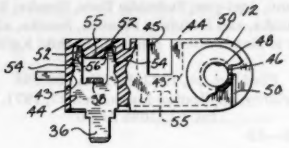
KICK-OUT SWITCH AND BUZZER

Spencer C. Schantz, New Berlin, and William R. Berry, Menomonee Falls, both of Wis., assignors to Spencer C. Schantz, New Berlin, Wis., by said William R. Berry

Filed Nov. 15, 1972, Ser. No. 306,526

Int. Cl. H01r 9/08

U.S. Cl. 339—221 R **3 Claims**



An electric coil is coupled across a pair of normally closed electric contacts which are attached to two electric terminals. The contacts and terminals are supported by pockets in an insulating base member which also supports a bobbin upon which the electric coil is wound. Each terminal is supported within its pocket by a pair of spaced legs having projecting spurs which bite into the margins of the pockets and prevent the terminals from being withdrawn. An armature is pivotally mounted over one end of the coil, and an actuating arm is attached to the armature for opening the contacts in response to a predetermined amount of movement by an object in contact with the actuating arm. This energizes the coil by removing the short circuit around it and causes the armature to buzz until the coil is de-energized.

3,815,083

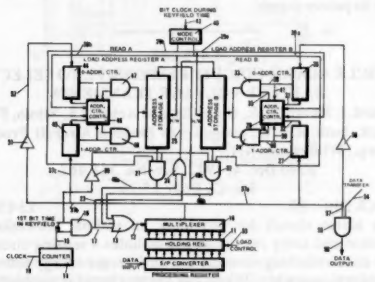
METHOD AND ARRANGEMENT FOR SORTING RECORD UNITS HAVING KEYFIELD BITS ARRANGED IN DESCENDING ORDER OF SIGNIFICANCE WITHOUT COMPARATOR

Gerhard Dirks, Los Altos Hills, and Paul F. Schenck, Mountain View, both of Calif., assignors to Dirks Electronics Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 104,658, Jan. 7, 1971, Pat. No. 3,714,634. This application July 13, 1971, Ser. No. 162,172

Int. Cl. G06f 7/06

U.S. Cl. 340—172.5 **29 Claims**



Record units, each addressable by a record unit address, have keyfields with keyfield bits arranged to be presented in descending order of significance. The record unit addresses are separated into first and second address groups, comprising all addresses corresponding, respectively, to record units having a most significant keyfield bit of 0 and 1. The first and second address groups are each similarly subdivided into two successive address sub-groups in dependence on the next most significant keyfield bit of each record unit. The separating process of each successive sub-groups of addresses is continued under control of equally weighted bits from each record unit until all keyfield bits have been utilized. A system of indicator numbers are assigned to each record unit address and are modified during each successive sub-grouping to reflect from which of the immediately preceding sub-groups the address is derived.

3,815,084

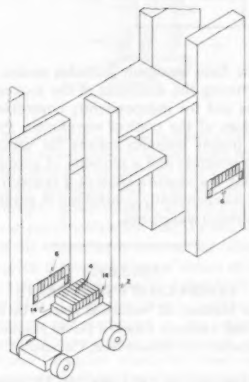
RETROREFLECTIVE ADDRESSING TECHNIQUE

Logan L. Pease, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 19, 1971, Ser. No. 200,485

Int. Cl. G08g 1/12

U.S. Cl. 340—23 **5 Claims**



An optical addressing system for controlled vehicles comprising an address strip mounted adjacent a desired location and formed with a plurality of possible code positions selectively coated with retroreflective material to provide an optical binary address designation, together with a plurality of sensing heads carried by the controlled vehicle and each serving to direct a collimated light beam toward said address strip and to establish an electrical signal in response to reflection of said light beam by said address strip. Both method and apparatus are disclosed.

3,815,085

CROSSROADS CONTROLLER

Ignace Leclercq, Massy, France, assignor to Societe de Fabrication d'Instruments de Mesure S.F.I.M., Massy, France

Filed Oct. 15, 1971, Ser. No. 189,713

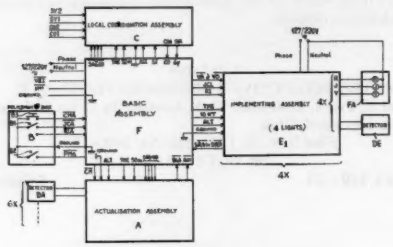
Claims priority, application France, July 15, 1971, 71.25894

Int. Cl. G08g 1/085

U.S. Cl. 340—41 R **15 Claims**

The apparatus controls the operation of a plurality of traffic signals. The apparatus includes a programmable basic assembly and at least one implementing assembly. Each implementing assembly selectively gates electricity to the lamps of a group of signals. The basic assembly exercises control over the operation of the implementing assemblies by providing to them in parallel a plurality of time-varying, binary-valued, digital control signals, each corresponding to a different display device. Preferably, one binary value orders a green-light condition and the opposite binary value orders a not green-

light condition, and each implementing assembly includes timing means responsive to transitions between light-condition orders for sequentially actuating the lamps. The time-varying digital signals respectively define a plurality of repeating digital patterns or control waveforms. The control waveforms have a common duration (i.e., the time from when a pattern in one of the control waveforms begins to when it next begins to repeat is the same for all control waveforms) that is defined by a plurality of successively occurring sub-intervals or



sequences. The basic assembly includes means for independently programming the durations of the successively occurring sequences and for independently controlling in parallel the binary values of the control waveforms. Preferably, the programming means includes means for identifying which sequence is in progress and a plurality of gating means each operative during the identification of a respective one of the sequences for independently controlling in parallel the binary values of the control waveforms.

3,815,086

COMPULSORY SEAT BELTS

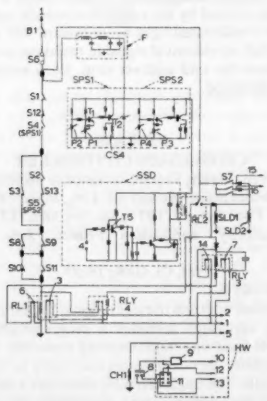
Leslie Graham Minton, 32 Nutbrook Ave., Tile Hill, Coventry CV4 9LD, and Anthony Edward David Hughes, "Lyncrest" 58 Wellesbourne Rd., Mount Nod, Coventry CV5 7HN, both of England

Filed Oct. 26, 1971, Ser. No. 192,666

Claims priority, application Great Britain, Oct. 23, 1970, 50587/70; Dec. 12, 1970, 59382/70

Int. Cl. B60r *21/10*

U.S. Cl. 340—52 E **4 Claims**



An automobile seat belt system ensures that the belts of occupied seats are properly worn. The system compares the amount of belt withdrawn from an inertia reel with the position of the seat and the angle of the seat back, and if the amount of belt is outside the normal range or the angle of the belt is abnormal in respect to the driver's or any occupied passenger seat, a warning device is actuated when the vehicle speed exceeds a predetermined low speed. The system may also lock any fastened seat belts when the transmission is placed in gear and when the vehicle speed exceeds the predetermined low speed.

3,815,087

APPARATUS FOR PREVENTING THE DRIVING OF AN AUTOMOBILE OR THE LIKE WHEN THE OPERATOR IS UNDER THE INFLUENCE OF ALCOHOL

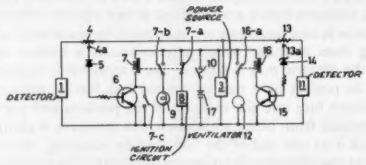
Tadao Hirano, Agei-gun; Sadasuke Toda, Suzuka; Katuo Okugawa, Suzuka, and Kazutaka Monden, Suzuka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1972, Ser. No. 300,995

Claims priority, application Japan, Oct. 27, 1971, 46-84640

Int. Cl. G08b *21/00*

U.S. Cl. 340—53 **7 Claims**



An apparatus is provided for preventing an operator from driving a motorcar or the like when under the influence of alcohol. The apparatus detects the alcohol content in the exhalation of the driver and selectively makes the motorcar impossible to drive. Detecting apparatus is also provided for detecting the alcoholic content of the exhalation of a fellow passenger. In the event that a fellow passenger is under the influence of alcohol but not the driver, operation of a ventilation apparatus is initiated for venting the interior of the motorcar. This prevents the operation of the first noted detecting apparatus and prevents rendering the motorcar inoperative. Furthermore, an apparatus is provided for restoring the operability of the motorcar. Preferably the detecting apparatus is associated with a Zener diode, which operates a relay, which separates, for example, the ignition circuit of the motorcar from its power supply.

3,815,088

VEHICLE ALARM CIRCUIT RESPONSIVE TO SELECTED BATTERY VOLTAGE TRANSIENTS

Richard J. Kumpfbeck, Dix Hills, and Aristide J. Vitolo, Floral Park, both of N.Y., assignors to Sheldon Aircraft Products Corp., Whitestone, N.Y.

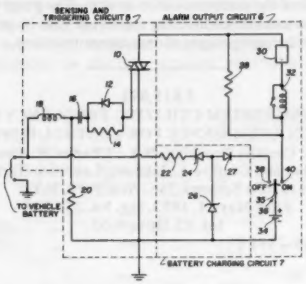
Filed Dec. 4, 1972, Ser. No. 311,461

Int. Cl. B60r *25/10*

U.S. Cl. 340—63 **13 Claims**

An alarm circuit for providing an audible indication of unauthorized entry into a vehicle includes a sensing circuit, a solid state switching element and an internal energy source in an integral assembly. When the alarm circuit is enabled, the control port of the switching element responds via the sensing circuit to the negative voltage transient at the car battery upon entry (caused by the initial surge current to illuminate the interior courtesy lights) to render the switching element conductive, thereby applying the potential of an internal battery across a horn, buzzer or the like.

In accordance with further aspects of the present invention, a charging circuit for the internal battery and apparatus for



triggering an alarm responsive to a disconnection of the alarm circuit from the car or its battery are provided.

3,815,089

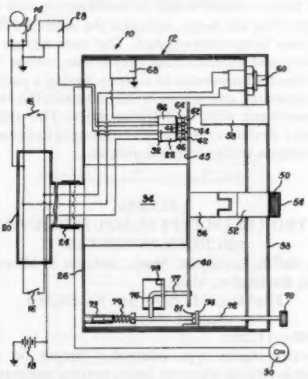
ANTI-HIJACKING VEHICULAR ALARM SYSTEM WITH TIMER CONTROLLED ALARM CIRCUIT

Joseph P. Beltrami, Garfield, N.J., assignor to ITAD Alarm Systems, Inc., Garfield, N.J.

Filed Dec. 28, 1971, Ser. No. 213,017The portion of the term of this patent subsequent to Apr. 11, 1989, has been disclaimed.

Int. Cl. B60r *25/10*

U.S. Cl. 340—64 **10 Claims**



An anti-hijacking vehicular alarm system in which the vehicle alarm circuit may be activated only for a preselected interval of time, the duration of which interval cannot be shortened once selected such that the vehicle cannot be operated without activation of the alarm circuit, and the alarm circuit, once activated, cannot be deactivated at will. Where the vehicle has an ignition circuit, the ignition circuit is activated only upon activation of the vehicle alarm circuit.

3,815,090

METHOD AND CIRCUIT ARRANGEMENT FOR AUTOMATIC RECOGNITION OF CHARACTERS WITH THE HELP OF A TRANSLATION INVARIANT CLASSIFICATION MATRIX

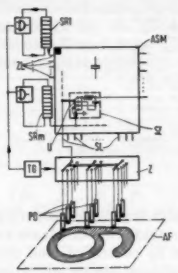
Meinolf Muenchhausen, Gauting, Germany, assignor to Siemens Aktiengesellshaft, Berlin & Munich, Germany

Filed Sept. 26, 1972, Ser. No. 292,288

Claims priority, application Germany, Sept. 27, 1971, 2148152

Int. Cl. G06k *9/12*

U.S. Cl. 340—146.3 MA **7 Claims**



A method and apparatus for automatic character recognition of characters which may be varied, even within a class of significance, according to shape, size and position in a raster of a column-wise scanning field. The sensed data is transformed according to given rules in several steps to provide a translation invariant classification matrix from which a class of significance of the character is derived for which the highest probability is given through the use of values of individual elements. The scanning signals obtained during the scanning of the scanning field, and corresponding to the black value of the scanning elements and arranged in the scanning field in columns are one-dimensionally transformed with a set of orthogonal Walsh functions which has been extended over phase shifted sequences in such a way that the transformation result of a number of scanning signals forms a value of a one-dimensionally transformed image matrix. The transformed image matrix is again transformed in the same manner with a transposed set of applied Walsh functions and therefore results in a two-dimensionally transformed image matrix. From the two-dimensionally transformed image matrix a classification matrix, denoted as a sequence spectrum, is embodied in such a way that partial ranges merely due to phase shifted sequences of Walsh functions of equal order, and limited by lines and columns of equal order, are combined in the two-dimensionally transformed image matrix by means of maximum value formation. Absolute values are found from the latter, as well as all remaining values of the two-dimensionally transformed image matrix, and are transferred as spectrum values into the sequence sprectrum. Combinations of the spectrum values are evaluated by discriminators and result in the probabilities for all possible classes of significance. The class of significance is therefore added to the sensed signals for which the most probability is provided.

3,815,091

REMOTE DEVICE CONTROL COMMUNICATION SYSTEM

Robert T. Kirk, Ogden, Utah, assignor to Eaton Corporation, Cleveland, Ohio

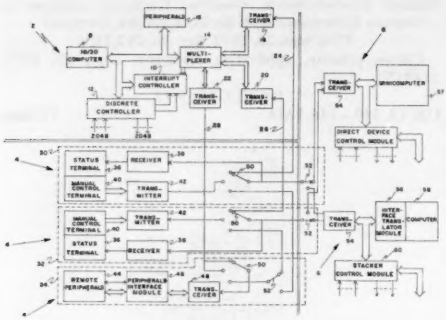
Continuation of Ser. No. 192,801, Oct. 27, 1971. This application Feb. 21, 1973, Ser. No. 334,509

Int. Cl. H03f *1/14*

U.S. Cl. 340—147 R **2 Claims**

A communication system for controlling remote devices, such as a plurality of vehicles. The system comprises a central

control area including a computer for normally controlling a plurality of vehicles, a plurality of manual control stations each operable to provide direct or remote manual control of a selected one of said vehicles, and a plurality of peripheral sta-

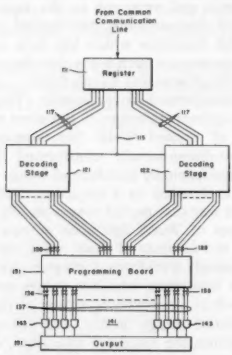


tions each operable to provide temporary automatic control of a selected one of said vehicles. Means are provided for selecting a vehicle to be controlled, and means selectably places control of the selected vehicle under either said central control area or a responsive one of said stations.

3,815,092
CODING AND DECODING METHOD AND APPARATUS

Richard D. Stephenson, Randolph, N.J., assignor to Universal Technology Inc., Verona, N.J.

Filed May 21, 1973, Ser. No. 362,044
Int. Cl. H04q 9/00
U.S. Cl. 340—147 P **13 Claims**



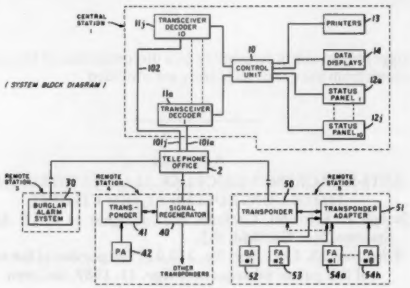
A method and apparatus are described for coding and decoding the signals used in a communication system. The coding apparatus comprises an input means, at least two programmable coding matrices connected in parallel to the input means, and a code character generator connected to each coding matrix. Each coding matrix comprises a first plurality of input leads, a second plurality of output leads, and selective connections between the input leads and the output leads so that each input lead is connected to one output lead. The parallel combination of coding matrices and character generators provides for a very large number of possible code characters. The decoding apparatus comprises a register, at least two decoding stages connected to the register, each of which converts a portion of a signal of MARKS and SPACES into an output on one of a plurality of leads, means for monitoring at least one lead from each decoding stage for the coincidence of a signal on each tested lead, and programmable means for connecting the output of the decoding stages to the monitoring means.

With appropriate input means and coding matrices, the coding apparatus can be used to generate the calling codes used for control of the communication system. The programmable coding matrices and connecting means can also be used in the coding and decoding stages of data communication.

3,815,093
SIGNALING SYSTEM UTILIZING FREQUENCY BURST DURATION AND ABSENCE FOR CONTROL FUNCTIONS

Howard L. Caretto, Brooklyn, N.Y.; Charles W. Cook, Huntsville, Ala., and Gustave A. Johnson, Laurence Harbor, N.J., assignors to AFA Systems, Inc., New York, N.Y.

Filed May 11, 1973, Ser. No. 359,238
Int. Cl. H04q 9/00
U.S. Cl. 340—152 T **9 Claims**



A signaling system has a plurality of remote transponders, which transmit signals, representative of the states of sensors associated with the transponders, to a central station in response to addressed interrogation signals transmitted by the central station. The interrogation signals include audio frequency bursts, whose width, in combination with the width of the space after the burst, indicates the address of the transponder group being interrogated. The state signals from the transponders also include frequency bursts, whose frequency indicates which transponder of a group having a particular address is responding and whose width indicates the state of the sensors associated with that transponder. The state signals cause display devices at the central station to indicate changes in the conditions at the remote monitors.

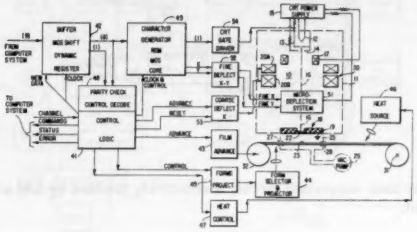
3,815,094
ELECTRON BEAM TYPE COMPUTER OUTPUT ON MICROFILM PRINTER

Donald O. Smith, Lexington, Mass., assignor to Micro-Bit Corporation, Burlington, Mass.

Filed Dec. 15, 1970, Ser. No. 98,259
Int. Cl. H01j 37/22
U.S. Cl. 340—172.5 **38 Claims**

An electron beam type computer output on microfilm printer employing an electron beam writing apparatus having an evacuated housing closed by a Lenard window fabricated from a differentially etched bulk supporting member through which the electron beam is directed for permitting egress out of the evacuated housing into a higher pressure ambient atmosphere surrounding the housing with a minimum of beam scattering while maintaining the integrity of the evacuated space within the housing. The thin window portion consists of a material different than the bulk supporting member and not susceptible to the etchant employed to form the window in the supporting bulky member and may be formed by chemical

reaction with the bulk supporting member from the class of materials consisting of Si—SiO_2; Al—Al_2O_3; Ta—TaO; Ti—TiO; Si—SiC; Si—SiN; Al_2O_3 on Si; and the like. The thin SiO_2, Al_2O_3, TaO, TiO, etc window layer preferably first is formed to a desired thickness on the surface of a bulk supporting member by chemical reaction with the thin elongated window then being etched in the bulk supporting member by an etchant which does not react on the thin window layer. The electron beam type computer output on microfilm printer further includes an electron sensitive microfilm recording



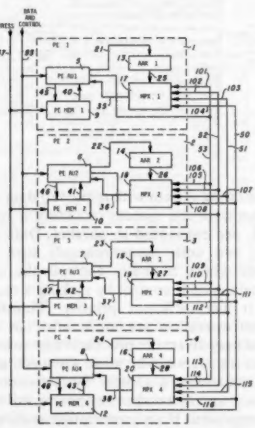
medium and transport means supporting the microfilm recording medium immediately adjacent the thin window portion of the electron beam recording apparatus. Printer control circuit means are coupled to the electron beam writing apparatus and the transport means for controlling the operation thereof. A character generator supplied from a buffer memory unit and controlled by the printer control circuit controls deflection and beam blanking of the electron beam recording apparatus. Use of the buffer memory allows the E-Beam COM printer to be easily interfaced with any computer system as a standard plug compatible peripheral equipment.

3,815,095

GENERAL-PURPOSE ARRAY PROCESSOR

Aaron H. Wester, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 29, 1972, Ser. No. 284,529
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **2 Claims**



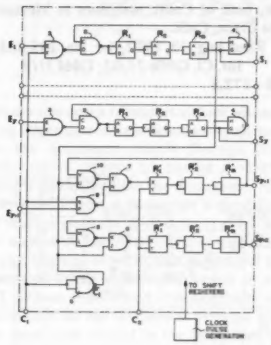
A general-purpose array processor allows each processor to transfer its output to any other processor in the array. Each processor contains its own memory, address register, and input selection multiplexer whereby an address may be transferred from a processor memory to its address register; and the information in the address register is used by the selection multiplexer to select one input from all array processor outputs.

3,815,096

STACKING STORE HAVING OVERFLOW INDICATION FOR THE TRANSMISSION OF DATA IN THE CHRONOLOGICAL ORDER OF THEIR APPEARANCE

Roland Sylvain Nahon, 36 rue du General Delestraint, Paris, France, assignor to Jeumont-Schneider, Paris, France

Filed June 5, 1972, Ser. No. 259,412
Claims priority, application France, June 7, 1971, 7120442
Int. Cl. G11c *19/00*
U.S. Cl. 340—172.5 **1 Claim**



A stacking store having overflow indication and of use for the transmission of binary data in the chronological order of their input (write-in). The stacking store is characterized in that it comprises store circuits, a first and second auxiliary circuit and a clock. The store circuits are equal to the number of bits in the data to be transmitted and each store circuit comprises: a *n* stage shift register (each stage having two inputs connected to one another and one output); and three logic type routing gates having two inputs and one output, viz. a first gate whose first input receives the input bit corresponding to the store circuit and whose other input receives a logic type signal permitting write-in into the store, such signal being called "first logic signal" hereinafter, a second gate whose first input is connected to the output of the first gate and whose second input is connected to the output of the third gate, the register having its input connected to the output of the second gate and its output connected to the first input of the third gate, the second input of the latter gate receiving the complement of the first logic signal, the output of each store circuit being the output of its register. The first auxiliary circuit comprises a n stage shift register identical to the previous shift register, the two inputs of the first stage not being connected to one another as in (1), one of the latter inputs receiving a logic control signal called the "second logic signal" and serving to erase from the store the information output thereby, the other input being connected to the output of a logic gate having two inputs connected to the respective outputs of two other logic gates each having two inputs and one output, the first of the latter gates having an input receiving an auxiliary bit called "overflow bit" and the other input receiving the first logic signal, the second of the latter gates having an input receiving the complement of the first logic signal, the other input being

connected to the output of the previous register which thus forms the output of the first auxiliary circuit, the logic state of the last-mentioned output possible saturation of the store. The second auxiliary circuit comprises a *n* stage shift register identical to the shift register of the first auxiliary circuit, the first input of the first stage receiving the second logic signal while the second input of the last-mentioned stage is connected to the output of a logic gate having two inputs, one of which receives the complement of the first logic signal while the other input is connected to the output of another logic gate having two inputs, one receiving the complement of the first logic signal and the other being connected to the output of the corresponding register, the latter output delivering an auxiliary bit called "marking bit" and forming the output of the second auxiliary circuit. The clock pulse generator triggers the stepping-on of the data towards the store output in all the shift-register set forth previously.

3,815,097

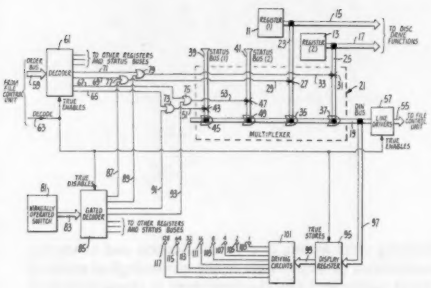
DISC DRIVE DIAGNOSTIC DISPLAY APPARATUS

Thomas E. Gardner, Mountain View, and Mihail C. Popovici, Sunnyvale, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Aug. 20, 1972, Ser. No. 285,033

Int. Cl. G05b *23/02*; G06f *3/14*

U.S. Cl. 340—172.5 **5 Claims**



A disc drive having a plurality of drive function binary registers and a plurality of binary status buses that are connected to a single output for conveying information to a file control unit of a central computer processer. A desired register or status bus is selected for connection to the single output by a command signal from the file control unit. A visual diagnostic display circuit is also connected to this single output and is made operable to display the state of a selected binary register or status bus in the intervals between commands from the file control unit. The register or status bus to be displayed is selected by a manual switch on the panel of the disc drive and is completely independent of the register or status bus selected at different time intervals by the file control unit.

3,815,098

ZERO SUPPRESSOR CIRCUIT

Takehiko Kimura, Tokyo; Yoshiaki Niizawa, Kawasaki, and Reiji Hirano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

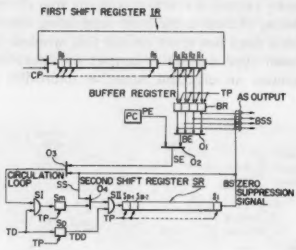
Filed Sept. 11, 1972, Ser. No. 287,640

Claims priority, application Japan, Sept. 17, 1971, 46-72201

Int. Cl. G11b *27/00*

U.S. Cl. 340—172.5 **6 Claims**

An electronic desk top calculator includes a displaying register for displaying input information and calculated result. In order to prevent undesired zeroes from displaying, a zero suppressor circuit is incorporated with the displaying register.



The zero suppressor circuit is effectively realized by LSI circuit.

3,815,099

DATA PROCESSING SYSTEM

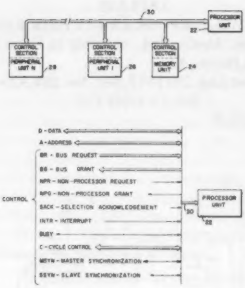
John B. Cohen, West Acton; Paul E. Janson, Boston, both of Mass.; Harold L. McFarland, Jr., Santa Clara, Calif., and James B. Young, Jr., Carlisle, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 24,636, April 1, 1970, Pat. No. 3,710,324.

This application Sept. 20, 1972, Ser. No. 290,644

Int. Cl. G06f *3/04*, *13/00*

U.S. Cl. 340—172.5 **10 Claims**

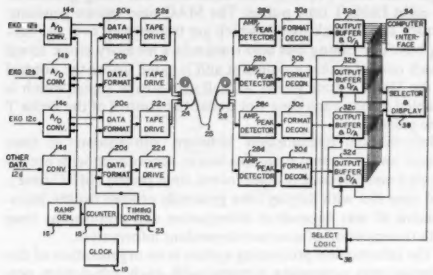


A data processing system with improved data transfer capabilities. All units in the system including a random access memory unit, are connected in parallel. Data is transferred between any two units asynchronously with respect to a processor unit which normally controls the system. Other units can obtain system control by making a request which is honored if it has sufficient priority. Transfers requiring processor unit operation are made after an instruction is processed and may divert the processor unit to an interruption routine. Other transfers can be made whenever another unit in the system is not making a transfer. System control is returned to the processor unit or another peripheral unit when the data transfer is completed. If an interruption routine is to be executed, control is returned to the processor directly. Data transfers are controlled by synchronization signals from the controlling peripheral unit and the other unit involved in the transfer.

3,815,100
SELF-CLOCKING SYSTEM UTILIZING GUARANTEED BIT TRANSITION

John E. Winchester, Sudbury, and Edward B. Rawson, Lincoln, both of Mass., assignors to Searle Medidata, Inc., Waltham, Mass.

Filed Nov. 7, 1972, Ser. No. 304,552
Int. Cl. H03k 7/02; G06f 15/42
U.S. Cl. 340—172.5 **13 Claims**

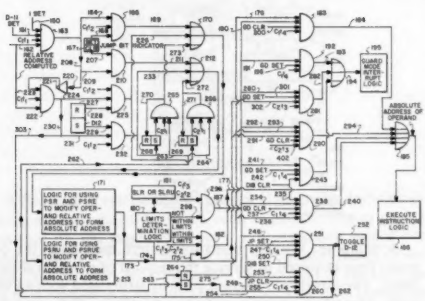


A system for digitizing signals for recording and/or transmission in a self-clocking mode. Simplified electronics are provided to sample an analog signal, typically an electrocardiogram signal, and convert its amplitude to a digital representation which is subsequently transformed into a simply generated, guaranteed bit transition self-clocking binary signal for use in medical data recording and transmission.

3,815,101
PROCESSOR STATE AND STORAGE LIMITS REGISTER AUTO-SWITCH

Garold D. Boss, Cottage Grove, Minn.; Vaemond H. Crane, Audubon; Donald G. McBeath, Furlong, both of Pa., and Martin D. Thompson, Burnsville, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 8, 1972, Ser. No. 304,696
Int. Cl. G06f 9/20, 11/00
U.S. Cl. 340—172.5 **8 Claims**

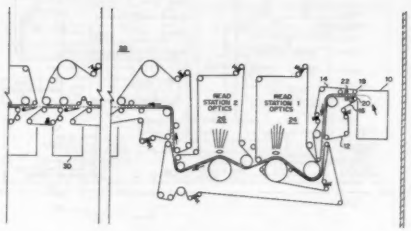


A means for automatically changing from a first to a second processor state register (PSR) when the relative address represented by the base value contained in the first of the PSR's does not fall within first predetermined limits. Logic means respond to such limits test failure to automatically switch active PSR's and recompute the absolute address using the base value contained in the other second PSR, followed by another limits test using second predetermined limits. When both limits tests fail a guard mode bit is tested which, if clear, will permit execution of the instruction outside the predetermined limits. When a jump instruction is involved, the switch of PSR's is made permanent until the occurrence of the next jump instruction requiring an automatic switching of PSR's.

3,815,102
METHOD AND APPARATUS FOR ITEM TRACKING

Joseph A. Plunkett, Plano, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed Dec. 1, 1972, Ser. No. 311,092
Int. Cl. B65h 43/00
U.S. Cl. 340—172.5 **30 Claims**



Documents are fed into a transport system wherein the leading and trailing edges thereof are detected by an item presence detector. As the document travels through the transport system various control stations are passed at which an operation is selectively performed on the document. After passing the various control stations, a document is deposited in one of a plurality of stacker pockets. A document is tracked through the transport system by means of tracking logic responsive to the leading and trailing edge signals generated by the item presence detector. These signals are stored in a document directory and an item code which is periodically incremented to reflect movement of the document through the transport system. Each item code stored in the document directory is sequentially compared with a location code of the various control stations and one of the stacker pockets as stored in a transport directory. When a comparison occurs between an item code stored in the document directory and one of the station location codes in the transport directory, one of the control stations is activated to perform a function on the moving document or one of the stacker pockets is opened. As a document moves into the transport system an initial determination is made of the document's mechanical configuration to determine if it meets certain selected initial conditions. When a fault is detected in the mechanical configuration of a particular document, a fault code is stored in the document directory and this code causes the document to be rejected into a reject stacker pocket in the transport system. For purposes of checking the transport system and the tracking logic, a document is simulated for comparison with the station location codes and the pocket codes in the transport directory.

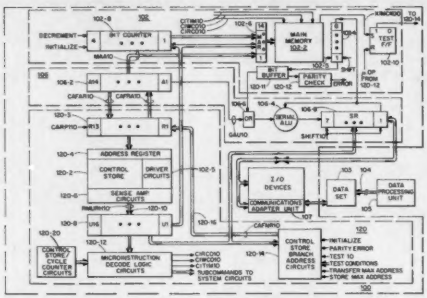
3,815,103
MEMORY PRESENCE CHECKING APPARATUS

Thomas O. Holtey, Newton, and Lallubhai O. Patel, Stoneham, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1973, Ser. No. 320,212
Int. Cl. G06f 11/00
U.S. Cl. 340—172.5 **27 Claims**

Each storage section of a memory system of a microprogrammed remote terminal system includes checking apparatus coupled to the memory read circuits of the section. The checking apparatus of each section is linked electrically to another section when that section is installed in the system. When a memory location of the memory is addressed, the terminal system generates a read command signal. Checking circuits respond by returning a control signal which sets a storage

device enabling the terminal system to detect when an attempt was made to access a nonexistent storage location. When such attempt occurs, the checking apparatus inhibits the return or echoing of the control signal thereby inhibiting the setting of the storage device. The terminal system after each memory cycle tests the state of the storage device and then inhibits



parity check circuits from causing the signaling of a nonexistent memory error when access has been made to an installed memory location. When an attempt is made to access of an uninstalled memory storage location, the parity checking circuits produce an error signal used for signalling the terminal system of such access.

3,815,104

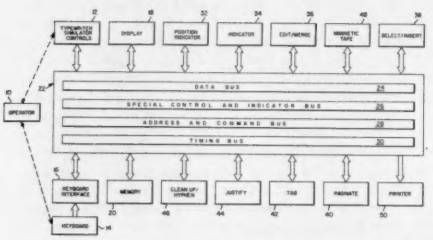
INFORMATION PROCESSING SYSTEM

Arnold J. Goldman, Sherman Oaks, Calif., assignor to Lexitron Corporation, Chatsworth, Calif.

Filed Jan. 18, 1973, Ser. No. 324,771

Int. Cl. G06f *15/00, 15/20*

U.S. Cl. 340—172.5 **6 Claims**



An information processing system having a plurality of subsystems including a display, a memory, and a manually operable data and control function entry device for interactive text processing by an operator via a keyboard whereby text entered on the display is modifiable under the control of the operator. Each of the sub-systems is interconnected to each of the other sub-systems by means of a communications bus which includes a data bus, a special control and indicator bus, an address bus and a timing bus. Digital information indicative of the text to be entered or operated on in the system is available simultaneously to all sub-systems by means of the data bus. The special control and indicator bus transmits signals between sub-systems, which signals are operator generated, or sub-system generated to enable pertinent sub-systems to receive or transmit information relevant to the performance of its function. The address bus provides a means for any subsystem in the system to address any other sub-system in the system or for any sub-system to cause any other sub-system to transmit commands or data to a third sub-system, which events may occur asynchronously with respect to system timing.

System timing information is provided to the sub-systems by means of the timing bus which transmits information necessary to divide the system timing into three major time frames which are display time, retrace time, and flyback time. Each time frame is furthere subdivided into time periods (MAC times) which time period corresponds to the time utilized for memory addressing each MAC time is further subdivided into eight time slots (T_0–T_7), with each time slot being generated by eight Delta T time pulses. The MAC time signals generate retrace and flyback signals which are transmitted over the timing bus. The timing bus also transmits a memory clock signal which occurs within a time slot and is gated under the control of the Delta T time pulses as well as a strobe signal which is enabled during each time slot under the control of the Delta T time pulses.

Information transmission between sub-systems is time shared on the communications bus in accordance with pre-allocated concurrence of time frame, time period (MAC time), and time slot with display time generally utilized for the transmission of text dependent information and non-display time with transmission of non-text dependent information.

The information processing system is an organization of distributed text processing systems with each sub-system performing a small number of specific operations on text, with each particular sub-system being activated whenever it detects, by monitoring the communications bus, a particular sequence of information including the pertinent time frame, time period (MAC time), and time slot necessary to the performance of the function.

3,815,105

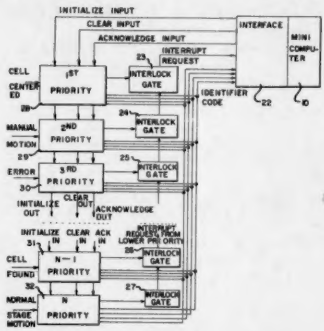
PRIORITY INTERRUPT SYSTEM

William J. Adkins, and Charles N. Carter, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 26, 1973, Ser. No. 400,914

Int. Cl. G06f *9/18*

U.S. Cl. 340—172.5 **4 Claims**



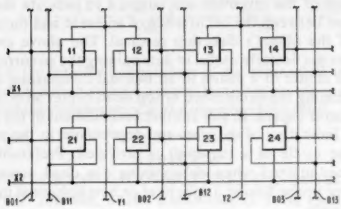
A computer priority interrupt system minimizes the computer time required to service the request of peripheral equipment. The interrupt system is priority structured with an interrupt identifier circuit which identifies the peripheral requesting service without requiring polling of all peripheral units. Priority interlocked gates, one associated with each peripheral unit, are connected in series in the order of priority. Request signals from lower priority peripheral units are passed through the interlock gate when the gates are enabled. Bistable circuitry associated with each peripheral unit blocks transmission of request signals from equal or lower priority units when the bistable circuitry is set. An encoder generates a code identifying the peripheral unit being serviced. This obviates the requirement for polling to determine which unit is being serviced.

3,815,106

FLIP-FLOP MEMORY CELL ARRANGEMENT

Siegfried Kurt Wiedmann, em Himmel 64A, 7 Stuttgart, Germany

Filed May 11, 1972, Ser. No. 252,433
Int. Cl. G11c 7/00, 11/40; H03k 3/286
U.S. Cl. 340—173 FF 15 Claims



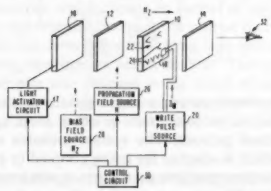
A memory cell arrangement allows the powering of only two row cells at any one time. This results in lower power dissipation in the cells and also permits the driving circuits to operate at a much lower power level, thereby further reducing the power dissipation per chip.

3,815,107

CYLINDRICAL MAGNETIC DOMAIN DISPLAY SYSTEM

George S. Almasi, Purdy Station, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,494
Int. Cl. G11c 11/42, 11/14
U.S. Cl. 340—174 YC 10 Claims



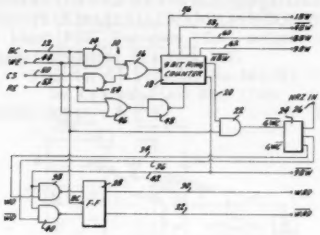
A flat display system using cylindrical magnetic domains existing within a magnetic sheet, such as orthoferrite or garnet. Located on the magnetic sheet is a propagation means corresponding to a horizontal shift register and a plurality of vertical shift registers for transferring the content of the horizontal shift register in a direction transverse to the data flow in the horizontal shift register. The vertical shift registers are terminated with domain collapsers. The domain generator supplies domains serially into the horizontal shift register in accordance with an applied data signal. When fully loaded, the contents of the horizontal register are shifted in parallel by the vertical registers. This continues until the entire pattern is on the magnetic sheet, after which the sheet is illuminated by incident polarized light. An analyzer is used to differentiate light which passes through a domain from that which does not pass through a domain. Consequently, an image corresponding to the stored domain pattern is viewed. Commercial TV applications are possible.

3,815,108

SELF-CLOCKING NRZ RECORDING AND REPRODUCTION SYSTEM

Ronald P. McGrath, Livonia, and William A. Bleher, Detroit, both of Mich., assignors to General Instrument Corporation, New York, N.Y.

Division of Ser. No. 235,583, March 17, 1972. This application Apr. 23, 1973, Ser. No. 353,807
Int. Cl. G11b 5/02
U.S. Cl. 360—41 11 Claims



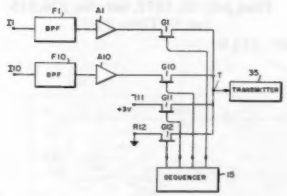
A magnetic recording and reading system wherein data is written into a magnetic medium in an NRZ code which is interrupted for the insertion of a guaranteed flux transition after each series of eight data cells. On readout, the guaranteed sync transition is used to generate a read clock for strobing purposes. The read clock is compensated to account for physical migration of the sync transition in the medium due to crowding effects or interaction with adjacent flux transitions.

3,815,109

MINIATURE MULTICHANNEL BIOTELEMETER SYSTEM

John B. Carraway, Glendale, and Joe T. Sumida, Los Angeles, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 5, 1972, Ser. No. 269,073
Int. Cl. G08c 19/16
U.S. Cl. 340—207 R 11 Claims

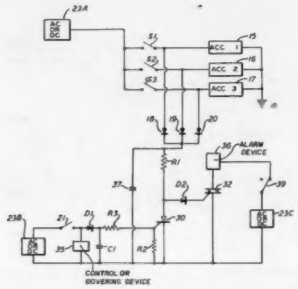


A miniature multichannel biotelemeter system includes a transmitter unit in which signals from different sources are sampled to produce a wavetrain of pulses in which sample pulses of all the signals are separated by sync pulses. The pulses amplitude modulate a radio frequency carrier which is received at a receiver unit. Therein the sync pulses are detected by a demultiplexer which routes the pulses from each different source to a separate output channel wherein the pulses are used to reconstruct the signals from the particular source.

3,815,110
WARNING ALARM FOR PROVIDING AN ALARM UPON OPERATING MEANS BEING UNINTENTIONALLY CONNECTED TO A POWER SOURCE

Sidney Davidson, 1 Lockhern Dr., Livingston Township, Essex County, N.J.

Continuation-in-part of Ser. No. 7,887, Feb. 2, 1970, abandoned. This application Mar. 23, 1972, Ser. No. 237,296
Int. Cl. G08b *21/00*
U.S. Cl. 340—213 R **4 Claims**

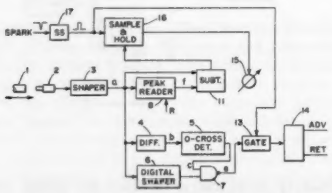


A warning alarm for providing an alarm upon first switch means being operated including an alarm device includes, a first solid state device electrically associated with a first switch and an alarm device for completing an energization path for the alarm device upon being operated. The first solid state device has a gate for receiving current for operating the first solid state device upon operation of the first switch. A second solid state device is electrically associated with the first switch, a second switch and the first solid state device. The second solid state device has a gate for receiving current for operating the second solid state device upon operation of the second switch. The second solid state device, when operated, shunts the gate of the first solid state device to preclude operation of the first solid state device and thereby interrupts the energization path for the alarm device.

3,815,111
APPARATUS FOR INDICATING AN OBJECT REVERSAL OF DIRECTION

Robert C. Abbe, Newton, Mass., assignor to Ade Corporation, Watertown, Mass.

Filed July 28, 1972, Ser. No. 276,115
Int. Cl. G01r *29/12*
U.S. Cl. 340—213 R **31 Claims**

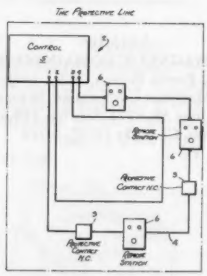


An apparatus containing a transducer and which provides an output signal when an object which is moving toward the transducer reverses direction to move away from the transducer. The transducer provides a signal which peaks in response to the direction reversal. In one embodiment of the invention, the transducer signal is initially differentiated. In another embodiment of the invention, the transducer signal is fed to a peak reader circuit adapted to provide a first output which rises until the peak of the transducer signal occurs and a second output that crosses zero when the transducer signal stops rising. In both of these embodiments, a zero-crossing detecting circuit is thereafter used to provide a signal in response to either the differentiated signal or the second signal from the reader circuit. The output of this zero-crossing detecting circuit thus indicates the object's reversal of direction. Another embodiment of the invention indicates the difference between the object's position at a particular time with respect to its position at which it previously changed direction. Other embodiments of the invention are adapted to indicate the time difference between the occurrence of an event and the occurrence of the object's direction reversal. The above embodiments are particularly useful in determining the occurrence of top dead center of a piston in an internal combustion engine and for timing the occurrence of top dead center with respect to the piston's spark. In still another embodiment of the invention, an indication of the rises and depressions in the surface of a base circle of a camshaft is provided. Preferably, the transducer utilized when determining top dead center is a capacitive probe having a spherical or hemispherical measuring electrode.

3,815,112
INTRUSION ALARM

David Kleber, 2077 Glaisbury Dr., Westbury, N.Y. 11590

Filed Aug. 9, 1972, Ser. No. 278,956
Int. Cl. G08b *23/00*
U.S. Cl. 340—214 **9 Claims**



An improved intrusion alarm system is disclosed for protecting homes or businesses or other areas against entry by unauthorized persons. The system includes a central alarm device which is adapted for being coupled to a number of detecting stations positioned at doors or windows or other critical points. These separate detecting stations are coupled together by a single conductor protective electric loop. This loop contains one or more control stations which may be positioned at positions remote from the central alarm station and the control stations utilize the same single conductor protective loop to both test the loop and to turn the alarm system on and off. This multiple use of a single conductor, i.e. for protective, test, and off-on control is made possible by the use of light emitting diodes at the control stations which are operatively coupled into the single conductor protective loop for providing indicator and control functions.

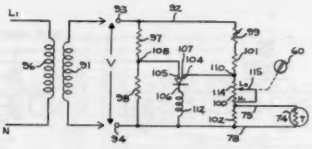
3,815,113
FOOD TEMPERATURE MONITORING APPARATUS

Stanley B. Welch, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 15, 1971, Ser. No. 124,325
Int. Cl. F24c *15/00*
U.S. Cl. 340—228 R **9 Claims**

A solid-state, electrical meat thermometer design for monitoring the interior temperature of meat being cooked. The design is based on a programmable unijunction transistor used

as a bridge detector that is combined in a circuit with a temperature sensing thermistor located in the tip of a meat probe that is adapted to be partially driven into the meat so as to



monitor the interior temperature of the meat while it is being cooked, and then actuate a signal buzzer upon the reaching of a presettable temperature at the interior of the meat.

3,815,114

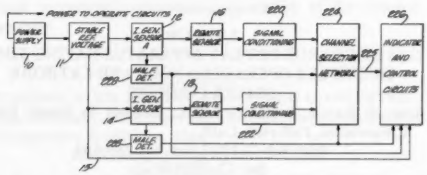
MULTI-CHANNEL COMBUSTIBLE GAS DETECTOR

Robert H. Johnson, 24266 Larkwood, El Toro, Calif. 92630, and Melvin C. Phillips, 11692 Eudora Ln., Garden Grove, Calif. 92640

Filed Oct. 12, 1972, Ser. No. 297,054

Int. Cl. G08b *23/00*

U.S. Cl. 340—237 R **12 Claims**



A system for detecting the presence of combustible gases employing remotely located sensors to provide separate output signals indicative of the gaseous environment at each sensor, the signals being first conditioned and then fed to a channel selection network which causes an output of only the one channel whose signal is the greatest, the output thereof being coupled to indicator devices for indicating high and low levels and for triggering appropriate alarm devices. The system has the ability to disable one channel in the event of any failure therein so as to prevent false alarms and to permit continued function of the system on the operative channel.

3,815,115

METHOD AND APPARATUS FOR PREPARING DENTAL CEMENTS AND CAVITY-FILLING COMPOSITION

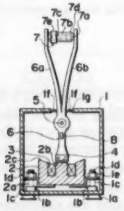
Kiyoshi Inque, Tokyo, Japan, assignor to IJR Inc. (Inoue & Japax Research Inc.), Yokohama, Japan

Filed Oct. 30, 1972, Ser. No. 301,999

Claims priority, application Japan, Oct. 10, 1971, 46-100578

Int. Cl. G08b *21/00*; **A61c** *5/06*

U.S. Cl. 340—261 **20 Claims**



A method of and apparatus for preparing dental cements or cavity-filling compositions (amalgams) where at least two components are combined by vibration, in which a change in the physical properties of the composition within a capsule or receptacle containing measured quantities of the two components to be combined, is continuously monitored and, when a predetermined degree of change is ascertained, a warning signal is generated or further mixing is terminated. The physical property which is continuously monitored may be the viscosity or reflective or transmissive properties of the composition with respect to an incident beam of radiation.

3,815,116

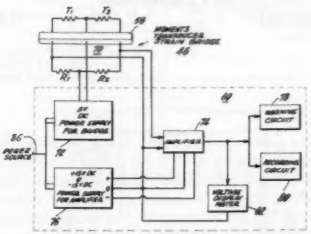
APPARATUS AND MEANS FOR MONITORING MOMENTS IN MATERIAL HANDLING EQUIPMENT

William Lloyd Fink, Galveston, Tex., assignor to Todd-Shipyards Corporation, New York, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,721

Int. Cl. G08b *21/00*; **B66f** *17/00*

U.S. Cl. 340—267 C **23 Claims**



A crane with a weight-lifting boom articulates about a pivot. Moments generated about the pivot are measured by mounting a strain gauge on a stress member which transmits a force from the boom to the crane's counterweight and which is located at a fixed position relative to the pivot. An electrically connected display alarm arrangement responds to the measurements and allows monitoring of the moments.

3,815,117

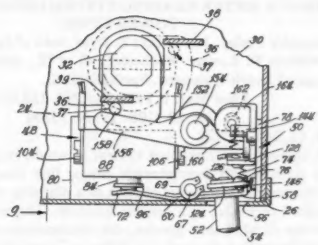
ALARM APPARATUS FOR OFFICE EQUIPMENT

Ardath A. Gopperton, Mount Prospect, Ill., assignor to The Paymaster Corporation, Chicago, Ill.

Filed Sept. 25, 1972, Ser. No. 291,777

Int. Cl. G08b *13/14*

U.S. Cl. 340—280 **10 Claims**



This invention is concerned with an alarm apparatus constructed in an enclosed housing and having attachment means for quick connection to a piece of office equipment. The alarm housing is made up of a box-shaped case and a removable base plate. Its major operating components are an alarm buzzer, a battery unit, two switch assemblies and a lock device, which are all contained within the housing. A rocker lever is pivotally mounted within the housing along its intermediate portion and carries a plunger on one of its arms which

is disposed to extend through an opening formed in the base plate. A spring provides a biasing force on the lever in a direction to urge the plunger to move down into engagement with the surface supporting the base plate. One of the switch assemblies includes a switch closing means for energizing the alarm buzzer when actuated by one of the lever arms in response to the plunger's downward travel caused by the lifting of the alarm housing. A second switch assembly has a switch closing means for energizing the alarm buzzer due to the actuation by one of the arms upon the plunger being raised. A lock device is provided for selectively deenergizing both of the switch assemblies to prevent their energization of the alarm buzzer regardless of the position of the plunger

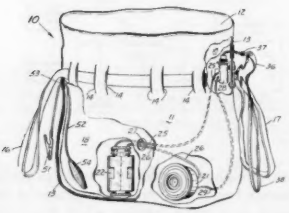
---

3,815,118

HANDBAG WITH A THEFT ALARM AND PROTECTION DEVICE

Lester E. McDonald, 7204 Shady Oak, Downey, Calif. 90240

Filed Dec. 27, 1971, Ser. No. 211,982
Int. Cl. G08b *21/00*
U.S. Cl. 340—283 **10 Claims**



A handbag is combined with an alarm that is connected to an elastic member, fitted over the wrist of the hand grasping the handbag. The elastic member has sufficient strength that it does not break when the handbag is snatched from the hand by a thief but, at the same time, the elastic member sets off the alarm. The elasticity within the member prevents the user from sounding the alarm inadvertently.

3,815,119

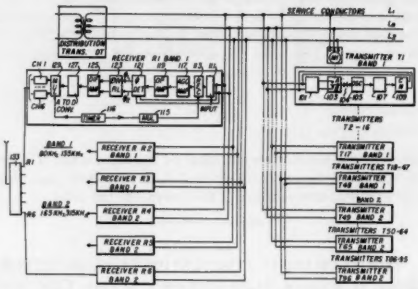
REMOTE METER READING SYSTEM USING ELECTRIC POWER LINES

Alexander Finlay, Jr.; Robert E. Dyer, both of Springfield, and William D. Kessler, Rochester, all of Ill., assignors to Sangamo Electric Company, Springfield, Ill.

Filed Mar. 1, 1972, Ser. No. 230,873
Int. Cl. G08c *19/14, 15/04*
U.S. Cl. 340—310 R **11 Claims**

A remote meter reading system in which transmitters provide data signals over electric power line conductors to indicate the measurements of each of a plurality of meters to associated receivers at a remote location. The meter transmitters are divided into groups, the transmitters of each group being operative to generate different frequency signals in a given frequency band assigned to such group. The transmitters of each group are further divided into subgroups, each subgroup of transmitters being connected to a correspondingly different pair of the power line conductors. A receiver unit is provided for each subgroup of transmitters, the receiver for a subgroup being tunable to the frequencies in the band assigned to the group, and being connected to the same pair of line conductors as the transmitters of its associated subgroup.

Each transmitter provides signals at a preassigned frequency as determined by the group and subgroup to which the transmitter is assigned, the signals being of a first and second phase to represent the meter measurement by logic 1 and logic



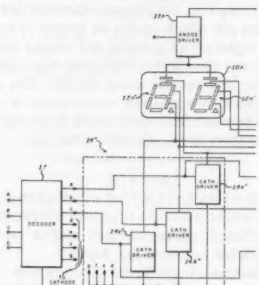
O signals. The signal input to each receiver is sampled for phase and converted to digital signals which are stored in discrete storage circuits for each of the transmitters.

3,815,120

GAS DISCHARGE DISPLAY APPARATUS HAVING TIME MULTIPLEX OPERATED ANODE AND CATHODE DRIVER CIRCUITS

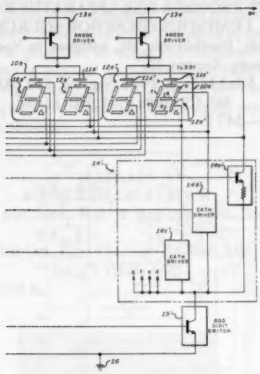
Alvin F. Kanda, Scottsdale, Ariz., assignor to Sperry Rand Corporation, Fullerton, Calif.

Filed July 7, 1972, Ser. No. 269,681
Int. Cl. G09f *9/32*
U.S. Cl. 340—336 **12 Claims**



An electronic driver circuit for a time-multiplex operated gaseous indicator display comprising a plurality of indicator tubes each including two or more cathode arrays for selectively presenting any one of several characters at each array position by establishing an ionizing potential difference between one or more cathodes of each array and its associated anode. The anodes of each tube are connected in parallel and anode excitation is applied to the individual tubes sequentially at a predetermined repetition rate. Corresponding cathodes of similar character positions in each tube are also connected in

parallel and cathode drivers coupled thereto are also rendered effective sequentially whereby a desired character is energized at each position during the interval in which anode excitation



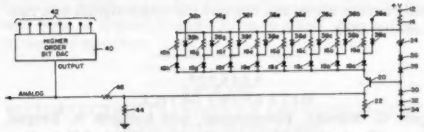
is applied thereto concurrently with activation of the associated cathodes, the rate of anode sequencing being rapid enough to provide continuous presentation of the selected characters.

3,815,121

CURRENT MODE DIGITAL-TO-ANALOG CONVERTER

Samuel Wilensky, Waltham, Mass., assignor to Hybrid Systems Corporation, Burlington, Mass.

Filed Dec. 1, 1972, Ser. No. 311,268
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 DA **7 Claims**



A digital-to-analog converter of relatively simplified design for ease of fabrication in discrete, hybrid or integrated circuit modes and consisting of a plurality of resistor-diode circuits connected in parallel across a voltage reference through the emitter-base junction of a current summing transistor. Available at the transistor collector is an analog representation of the digital input applied through respective switching diodes to the junction between the resistor and diode in each of the plurality of parallel circuits.

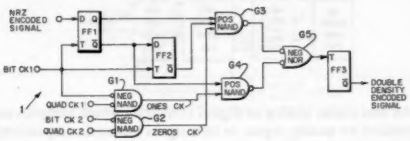
3,815,122

DATA CONVERTING APPARATUS

William F. Schwartz, Marlton, and Robert W. Butler, Cherry Hill, both of N.J., assignors to GTE Information Systems Incorporated, Stamford, Conn.

Filed Jan. 2, 1973, Ser. No. 320,455
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD **7 Claims**

A data converting apparatus for converting NRZ (non-return-to-zero) encoded signals to double density encoded signals. The data converting apparatus of the invention includes a first flip-flop operative to receive and store in succession the bits comprising an NRZ encoded signal, and a second flip-flop operative to receive and store in succession the bits stored in the first flip-flop. When a 1 bit is stored in the first flip-flop, a NAND gate coupled to the first flip-flop and to a first source of clock pulses operates, in response to a clock pulse from the first source of clock pulses, to produce an output pulse. This output pulse occurs at a time corresponding to the end of the bit period in which the 1 bit is present in the NRZ encoded signal. When a 0 bit is stored in the first flip-flop and no 1 bit is stored in the second flip-flop, a second NAND gate coupled to the two flip-flops and to a second source of clock pulses operates, in response to a clock pulse from the second source of clock pulses, to produce an output pulse.



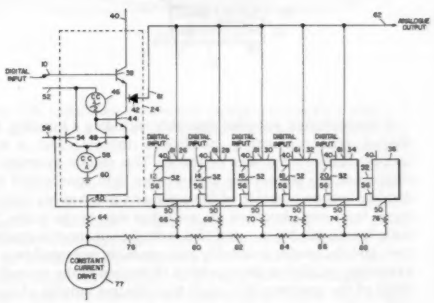
This output pulse occurs at a time corresponding to the center of the bit period in which the 0 bit is present in the NRZ encoded signal. When a 0 bit is stored in the first flip-flop simultaneously with a 1 bit being stored in the second flip-flop, no output pulses is produced by the second NAND gate. The output pulses produced by the two NAND gates are converted to an output signal, representing a double density encoded signal, in which the transitions occur at times corresponding to the times of occurrence of the output pulses produced by the two NAND gates.

3,815,123

LADDER TERMINATION CIRCUIT

William G. Howard, Jr., Mesa, and James B. Cecil, Tempe, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 109,464, Jan. 25, 1971. This application May 10, 1972, Ser. No. 252,133
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA **6 Claims**

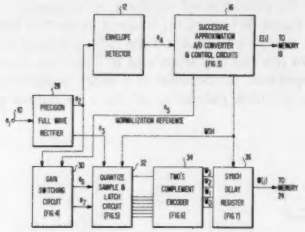


An improved termination circuit for the ladder portion of a digital to analog converter. The termination circuit includes an amplifier having unity current and voltage amplification factors and a very low impedance looking from the ladder into the amplifier.

3,815,124
ANALOG TO DIGITAL CONVERTER

Joe E. Brewer, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1973, Ser. No. 324,455
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **9 Claims**

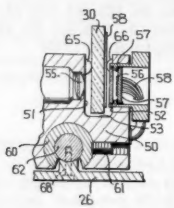

ENVELOPE DETECTOR
SUCCESSIVE APPROXIMATION A/D CONVERTER & CONTROL CIRCUITS (FIG. 3)
TO MEMORY
PRECISION FULL WAVE RECTIFIER
NORMALIZATION REFERENCE
WSH
GAIN SWITCHING CIRCUIT (FIG. 4)
QUANTIZE SAMPLE & LATCH CIRCUIT (FIG. 5)
TWO'S COMPLEMENT ENCODER (FIG. 6)
SYNCH DELAY REGISTER (FIG. 7)
TO MEMORY

An electronic analog to digital converter which samples and quantizes an analog signal in two signal channels respectively providing digital words corresponding to the envelope of the analog input signal and an amplitude normalized analog signal. The normalized or waveform signal defines the waveform structure which contains the analog signal frequency components above that contained in the envelope signal. The envelope digital word for a given time sample multiplied by the waveform digital word for that same time sample provides a digital word corresponding to the analog input signal.

3,815,125
PHOTOELECTRIC ENCODER ASSEMBLY

Paul L. May, North Little Rock, and Richard J. Poe, Conway, both of Ark., assignors to Baldwin Electronics Inc., Little Rock, Ark.

Filed Sept. 1, 1972, Ser. No. 285,596
Int. Cl. G08c *9/00*
U.S. Cl. 340—347 P **8 Claims**

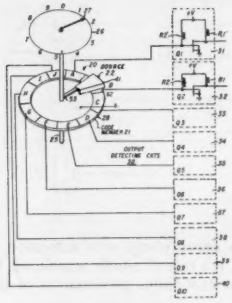


A photoelectric encoder assembly including a housing, a U-shaped reader assembly positioned therein, and a scale located between the legs of the U. The reader assembly includes one leg supporting at least one light source and condensing lens on one side of the scale and another leg supporting at least one photocell on the other side of the scale. The scale is translatably secured to a moved element of a machine tool, and the reader is slidably and rotatably mounted on a rod extending parallel to the direction of motion of the moved element of the machine tool, such that relative motion of reader and scale occurs as the element moves, the reader being pivotable on the rod to automatically correct for inaccuracies of orientation of the scale in response to movements of a pair of adjustably positioned, low-friction bearing surfaces in the form of nylon screws threaded into the legs of the reader assembly and bearing on both sides of the scale, for precisely relatively positioning the photosensitive element and the scale for all translations of the scale by preventing changes of spacing between the scale and the lens and photo-cell reader for all relative locations of reader and scale.

3,815,126
SHAFT ENCODER FOR APPARATUS HAVING LUMINOUS PHOSPHOR SOURCE

James E. Batz, Northbrook, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed Mar. 1, 1971, Ser. No. 119,588
Int. Cl. G08c *9/06*; H01j *1/62*
U.S. Cl. 340—347 P **16 Claims**

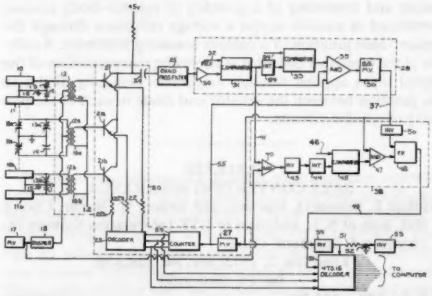


An analog-to-digital converter for converting angular positional information of a shaft associated with a meter dial register into binary coded outputs includes a non-contacting encoder having a code member with a plurality of photo resistive sense elements and a luminous phosphor source mounted for rotation by the shaft in enabling relationship with the code member providing radiant energy for energizing the sense elements selectively as the source rotates with the shaft relative to the sense elements to provide coded output signals representing ten digit positions and ten interdigital positions of the shaft; output decoding circuits provide round off of interdigital position codes and convert the coded signals to a two-out-of-five code.

3,815,127
DATA ENTRY DEVICE

Eugene G. Blumke, Bloomington, and Kenneth N. Bergan, Burnsville, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 20, 1973, Ser. No. 343,074
Int. Cl. H04l *15/06*
U.S. Cl. 340—365 S **15 Claims**



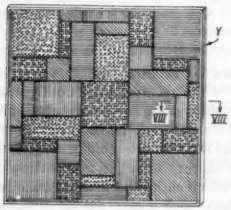
A data entry device comprises a plurality of pairs of sensors connected to a like plurality of bridge arrangements so that

actuation of one of said pair of sensors unbalances the respective bridge in one state and actuation of the other of said pair of sensors unbalances the respective bridge in an opposite state. Scanner means is provided to sequentially scan the bridges to provide signals whose amplitudes are representative of the state of balance or unbalance of the respective bridges and whose phase is representative of the sense of unbalance. A level detector is provided to sense the amplitude of signals from the scanner to provide an output signal indicative of the unbalanced bridge, and a phase detector is provided to sense the phase of signals to provide an output signal representative of the state of unbalance.

3,815,128
SONIC-COLOR SYSTEM

Robert Bruce McClure, R.D. 2 Box No. 290, Malvern, Pa. 19355

Filed Oct. 12, 1971, Ser. No. 188,339
Int. Cl. G08b *5/22*
U.S. Cl. 340—366 B **13 Claims**

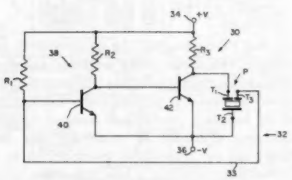


An electronically controlled audio-responsive color display is provided by a system wherein audio signals of various frequencies are utilized to effect illumination in various colors. Signal processing amplifies and limits total audio signal strength while substantially maintaining relative signal strength. The audio signals are segregated into a plurality of frequency bands, and the detected signal magnitude from each band is applied in pulse form to effect illumination in corresponding colors.

3,815,129
PIEZOELECTRIC TRANSDUCER AND NOISE MAKING DEVICE UTILIZING SAME

Louis P. Sweany, Carmel, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 65,622, Aug. 20, 1970, abandoned. This application Dec. 12, 1972, Ser. No. 314,469
Int. Cl. H03b *5/00*; **G08b** *3/00*
U.S. Cl. 340—388 **12 Claims**

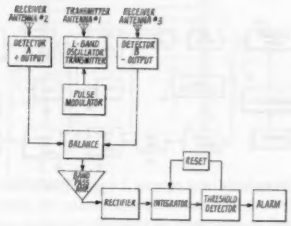


A noise making device, using a piezoelectric transducer, includes a piezoelectric element mechanically coupled to a substrate and an electrical circuit for energizing the transducer. The piezoelectric element includes a piezoelectric crystal, first and second electrode means carried by the crystal, and means dividing one of the electrode means into electrically isolated areas so as to provide a third electrode means.

3,815,130
NEAR FIELD TARGET DISCRIMINATION AND INTRUSION DETECTION SYSTEM

Frank J. Hayo, Santa Barbara, Calif., assignor to Metrophysics, Inc., Santa Barbara, Calif.

Filed Aug. 2, 1971, Ser. No. 167,940
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 PD **7 Claims**

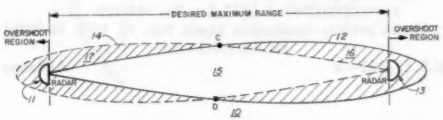


An intrusion detector circuit comprising multiple antennas to detect intrusion and yet eliminate signals attributable to near antenna movements which produce false alarms.

3,815,131
CW SURVEILLANCE RADAR SYSTEM

John D. Dautel, Rockville Centre; Denis F. O'Leary, East Northport, and Hubbard C. Turner, Jr., Northport, all of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 29, 1971, Ser. No. 202,997
Int. Cl. G01s *9/42*; **G08b** *13/24, 13/22*
U.S. Cl. 343—5 PD **6 Claims**

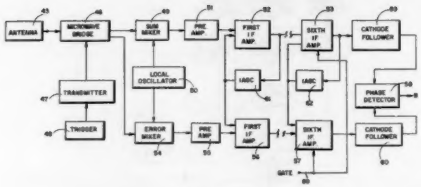


Two CW radars are positioned facing one another within a space which is to be closely guarded. Each radar is located within the transmitter beam of the other facing radar and operates at the same or a different CW frequency. A moving object within the surveillance space produces a doppler frequency shift in the echo return to each radar which produces a detected target signal. AND/OR logic gates responsive to the detected target signal from each radar provide an alarm or alert condition. The radar system has a resultant range versus object size characteristic over the surveillance space so that a small moving object such as a small animal will produce a detected signal in only one of the radars thereby indicating an alert condition while a large moving object such as a person will produce a detected signal in each of the radars thereby indicating an alarm condition. Radar returns from a large target, such as a vehicle, beyond the desired surveillance range will produce a detected signal in only one of the radars and will produce an alert but not an alarm condition.

3,815,132
RADAR FOR AUTOMATIC TERRAIN AVOIDANCE

Robert O. Case, Jr., La Habra, and Jerome M. Page, Downey, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed June 3, 1960, Ser. No. 33,860
Int. Cl. G01s 9/22
U.S. Cl. 343—7 TA 9 Claims



In an airborne radar having a forward looking antenna directed toward the ground at a relatively small depression angle,

means including said antenna for generating first and second signals indicative of the range and direction respectively of terrain lying within the beamwidth of the antenna;

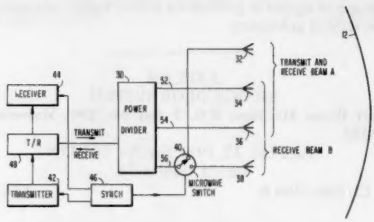
means responsive to said radar for generating a reference signal indicative of a preselected clearance distance, Ho, divided by said range R;

signal combining means responsive to said second signal and said reference signal for providing a warning signal indicative of the difference therebetween.

3,815,134
GROUND CLUTTER REDUCTION APPARATUS

Calvin C. Jones, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 23, 1972, Ser. No. 283,259
Int. Cl. G01s 9/02
U.S. Cl. 343—17.1 R 9 Claims

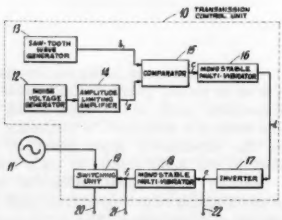


A "scan down on receive" antenna system wherein time base switching of the receiver horn configuration is provided in a multifeed radar system for ground clutter reduction. After a radar pulse is transmitted, the receive beam is incrementally relocated so that the antenna is electrically made to "look up" for a short time corresponding to that portion of the interpulse period during which short and intermediate range targets are received and then "look down" for the remainder of the interpulse period during which long range targets are received. Such a system of feed switching includes an alternate receive gain path which receives clutter returns in a greatly reduced manner while continuing to receive target returns of interest, i.e., short and intermediate range targets.

3,815,133
DOPPLER RADAR EQUIPMENT WITH INTERFERENCE PREVENTING APPARATUS

Kazuo Yasusaka, and Shigemichi Nagano, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 9, 1972, Ser. No. 304,929
Claims priority, application Japan, Nov. 12, 1971, 46-90964
Int. Cl. G01s 9/46
U.S. Cl. 343—8 4 Claims

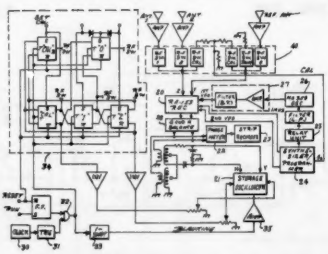


A Doppler radar for preventing collisions between vehicles or the like includes apparatus for rejecting direct high frequency energy radiated by (vis-a-vis reflected from) other radar equipped vehicles. The apparatus includes locally generated, randomly operative gating for both the radar transmitter and receiver, and integration (low pass filtering) of the receiver output such that interference from other units is effectively excluded.

3,815,135
DIRECTION FINDING INTERFEROMETER FOR A LINEAR FM SIGNAL

Paul E. Martin; William M. Sherrill, and Terence C. Green, all of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 26, 1972, Ser. No. 300,934
Int. Cl. G01s 5/02
U.S. Cl. 343—113 R 3 Claims

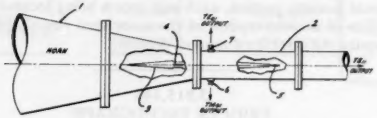


A direction finding interferometer apparatus for performing interferometic direction finding measurements against a linear FM/CW signal. A minimum number of antenna elements are utilized to provide interferometer phase measurements.

3,815,136
COAXIAL TRACKING SIGNAL COUPLER FOR ANTENNA FEED HORN

James V. Rootsey, Sunnyvale, Calif., assignor to Philco-Ford International, Philadelphia, Pa.

Filed Sept. 11, 1972, Ser. No. 287,708
Int. Cl. G01s 5/02
U.S. Cl. 343—117 8 Claims

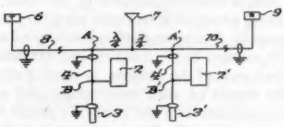


Tracking signals are extracted from the antenna feed horn by means of a two-stage coaxial coupler. The first stage consists of irises located on the horn end of a coaxial spear that extract signals in the first order circular transverse electric mode. The second stage consists of a probe located at the waveguide end of the coaxial spear that extracts TEM energy derived from signals in the first order transverse magnetic mode. Only one coupling stage is required for tracking circularly polarized signals, while both are required for tracking linearly polarized signals. In either case, fundamental mode transverse electric energy is passed without significant coupling or obstruction.

3,815,137
NOTCH FILTER NETWORK

Daniel P. Kaegebein, Depew, N.Y., assignor to Sinclair Radio Laboratories, Inc., Tonawanda, N.Y.

Division of Ser. No. 58,357, July 27, 1970, Pat. No. 3,717,827, which is a continuation-in-part of Ser. No. 646,064, June 14, 1967, abandoned. This application Nov. 27, 1972, Ser. No. 309,772
Int. Cl. H04l 5/08
U.S. Cl. 343—180 5 Claims

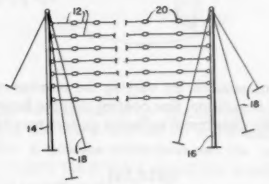


A duplex arrangement of filter networks has, on the transmitter side, a quarter wave cavity resonator tuned to the transmitter carrier frequency and coupled to the coaxial transmission line in quarter wave spaced relation. A variable quarter wave reactance section is similarly coupled to the line and coacts with the resonator to create a condition of antiresonance at the receiver frequency. On the receiver side, a quarter wave resonator and a variable quarter wave section are similarly coupled to the transmission line a quarter wave from the antenna connection, the resonator being tuned to the receiver frequency, and the reactance section coacting with the resonator reactance to create a condition of antiresonance at the transmitter carrier frequency. A line connecting the resonator to the transmission line can be of the same characteristic impedance or, if greater attenuation at a greater frequency separation is desired, of a lower characteristic impedance than that of said transmission line.

3,815,138
PASSIVE RERADIATOR OF RADIO-FREQUENCY ELECTROMAGNETIC ENERGY

Alan W. Haley, 3777 Kerner Blvd., San Rafael, Calif. 94901

Continuation-in-part of Ser. No. 228,188, Feb. 22, 1972, abandoned. This application Aug. 23, 1973, Ser. No. 391,423
Int. Cl. H01q 15/02
U.S. Cl. 343—754 10 Claims

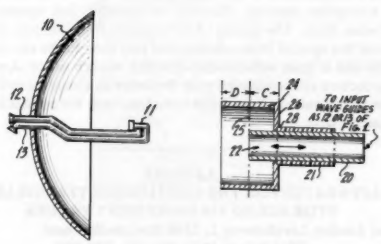


A device for reradiating r.f. energy into shadowed areas behind mountains, for example, said device comprising a passive antenna array without reflectors or transmission line and having a plurality of half-wave dipole antennas spaced from each other by electrical insulators, the dipoles being arranged in strings and the strings being arranged in vertically closely spaced rows between side-support members.

3,815,139
FEED HORNS FOR REFLECTOR DISHES

Robert F. Lewis, Lincroft, and James W. Nelson, Edison, both of N.J., assignors to Prodelin, Inc., Hightstown, N.J.

Filed Apr. 16, 1973, Ser. No. 351,245
Int. Cl. H01q 13/06, 19/14; H01p 1/16
U.S. Cl. 343—775 10 Claims



A feed horn for a parabolic reflector includes a feed waveguide capable of supporting a first electromagnetic mode and a cylindrical member surrounding an open-ended radiating portion of said feed guide and located about said open end at a distance to cause a second mode to be supported. Said first and second modes as propagating combine to provide a radiation pattern for illuminating said reflector to provide a high performance antenna system.

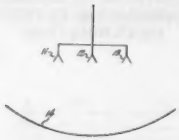
3,815,140
MULTIPLE FEED FOR MICROWAVE PARABOLIC ANTENNAS

Walter E. Buehler, Issaquah, and Clarence D. Lunden, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 6, 1972, Ser. No. 304,226
Int. Cl. H01q 19/14
U.S. Cl. 343—779 8 Claims

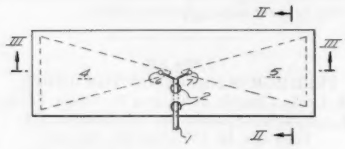
A multiple feed microwave antenna. Individually fed illuminators are placed in a predetermined configuration with respect to each other and to a single parabolic reflector and are fed with predetermined current values so as to produce a

highly directional microwave radiation pattern. The radiation pattern is relatively broad and contains a plurality of discrete areas of information, distinguished by different carrier and



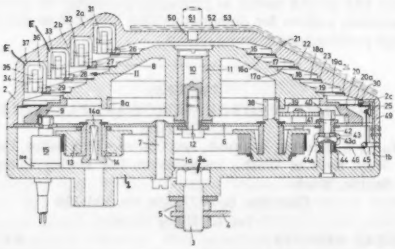
modulating frequencies. By varying the number of illuminators and their separation, fine control over the beamwidth and the shape of the directional radiation pattern may be obtained.

3,815,141
HIGH FREQUENCY ANTENNA
Edward Kigler, 39 Little Tor Rd. N., New City, N.Y. 10956
Filed Jan. 12, 1973, Ser. No. 323,313
Int. Cl. H01q *9/28*
U.S. Cl. 343—795 **3 Claims**



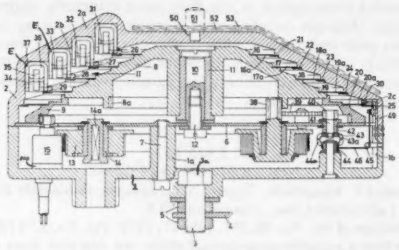
A sheet composed of two superimposed laminae of electrically non-conductive synthetic plastic foil material has a pair of triangular antenna elements of metallic foil sandwiched between them. The apices of the metallic foil elements are adjacent but spaced from one another and their bases are remote from and at least substantially parallel to each other. Antenna conductors are connected with the antenna elements in the region of the apices thereof and have free ends for connection to a user device.

3,815,142
APPARATUS FOR THE CONTINUOUS TEMPORARY STORAGE OF MEASUREMENT VALUES
Max Amsler, Lerchenweg 2, 2500 Biel, Switzerland
Filed July 5, 1973, Ser. No. 376,802
Claims priority, application Switzerland, July 7, 1972, 10220/72
Int. Cl. G01d *15/28*
U.S. Cl. 346—21 **5 Claims**



An apparatus for the continuous temporary storage of a number of measurement values, comprising ring-shaped disks at which rims of tongues are formed, said ring-shaped disks being reduced as regards their internal and external diameter in the manner of a row of steps and being concentrically arranged and in axial spacing behind one another at an at least substantially truncated conical-shaped portion of a revolving element. There are provided support portions comprising ring-shaped disks which are also reduced with respect to their internal- and external diameter in the manner of a row of steps and being concentrically arranged and at an axial spacing behind one another at the inner surface of a transparent housing portion. Devices including individual respective control elements are accommodated in recesses at the inside of the transparent housing portion, each said recess being located at the region of an interruption of the associated ring-shaped disk forming the associated support portion.

3,815,143
VEHICLE TACHOGRAPH
Max Amsler, Lerchenweg 2, 2500 Biel, Switzerland
Filed July 5, 1973, Ser. No. 376,803
Claims priority, application Switzerland, July 7, 1972, 10221/72
Int. Cl. G01d *9/30*
U.S. Cl. 346—21 **6 Claims**

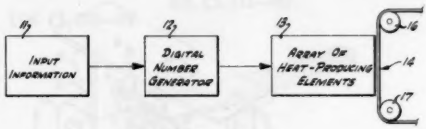


A vehicle tachograph intended to be connected with a tachometer shaft, comprising a housing, a rotor arranged for rotation within said housing, the rotational speed of the rotor being proportional to the speed of the vehicle. At least one ring-shaped disk is coaxially secured to the rotor, said ring-shaped disk being provided at its entire periphery with radially protruding tongues. A support portion interrupted at one location is fixedly secured to the housing and extends along the path of the free ends of the tongues. A control element is arranged at the region of such interruption and a switching mechanism cooperates with the control element for moving the control element briefly from one terminal position into another terminal position. There is further provided a second rotor and a motor drive for the second rotor for imparting thereto rotational movement, so that it only carries out one revolution in a predetermined time interval of a number of hours. A further ring-shaped disk having radially protruding tongues is secured to the second rotor, said ring-shaped disk of the second rotor being similar to the ring-shaped disk of the first rotor and likewise having a second support portion, a second control element arranged at the region of the interruption thereof. The second control element cooperates with the tongues of the second ring-shaped disk in the same manner as the corresponding control element cooperates with the tongues of the first ring-shaped disk. A drive mechanism is provided between the first rotor and the second control element, so that the second control element assumes one terminal position only when the rotor carries out a rotational movement corresponding to travel of the vehicle, otherwise however assumes its other terminal position.

3,815,144
THERMAL RECORDER HAVING AN ANALOGUE TO DIGITAL CONVERTER

Howard H. Aiken, 1511 S. Ocean Dr., Fort Lauderdale, Fla. 33316

Filed Sept. 14, 1972, Ser. No. 288,957
Int. Cl. G01d *5/12, 15/10*
U.S. Cl. 346—35 **7 Claims**

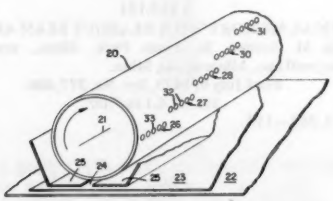


An apparatus for recording electrical signals on moving paper charts in which the magnitude of the electrical signal is translated into a digital number by an analog to a digital converter. The digital number acts through a group of switching elements to select and pass current through one of a plurality of small resistive elements diffused into a semiconducting material. This current causes the selected element to increase temperature to a value sufficient to cause an adjacent thermally sensitive paper to change its state and darken in the small area so heated, thus giving a record on the paper of the discrete position represented by the particular digital number and hence the magnitude of the original electrical signal.

3,815,145
ELECTROSTATIC PRINTING SYSTEM AND METHOD USING A MOVING SHUTTER AREA FOR SELECTIVE MECHANICAL AND ELECTRICAL CONTROL OF CHARGED PARTICLES

Thomas A. Tisch, Saratoga, and Thomas A. Jenkins, Redwood, both of Calif., assignors to ElectroPrint, Inc., Cupertino, Calif.

Filed July 19, 1972, Ser. No. 273,239
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 EB **7 Claims**



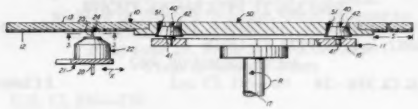
An electrostatic printing system and method in which a charged particle stream directed toward a print receiving medium is selectively controlled by mechanical and electrical modulation or shuttering and mechanical motion of the shutter area to achieve character serial and line serial printing.

3,815,146
RECORD-TURNTABLE ASSEMBLY AND METHOD OF MAKING

Leonard A. Nash, Lake Forest, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 9, 1973, Ser. No. 349,132
Int. Cl. G01d *15/32*
U.S. Cl. 346—137 **8 Claims**

A record and turntable assembly featuring precise and repeatable angular and linear positioning of the record on the turntable, and positive rotary drive. The turntable is provided with three conically tapered mounting pins projecting from the surface and arranged in a scalene triangular array. The record is formed with matingly tapered mounting holes arranged in a congruent triangular array, so that the record and

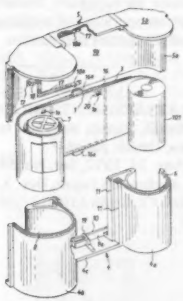


turntable can be assembled by placing the record on the turntable with the holes received on and engaging the pins. This provides a positive drive between the turntable and record, and assures the desired, repeatable angular and linear positioning of record on the turntable.

3,815,147
CASSETTE WITH PHOTOGRAPHIC ROLL FILM

Richard Wick, and Alfred Winkler, both of Munich, Germany, assignors to AFGA-Gevaert AG, Leverkusen, Germany

Filed Mar. 15, 1973, Ser. No. 341,608
Claims priority, application Germany, Mar. 23, 1972, 2214151
Int. Cl. G03b *17/26*
U.S. Cl. 354—203 **10 Claims**



A cassette for photographic roll film which is surrounded by a strip of opaque backing paper. The cassette has a film supplying section which receives a roll of unexposed film and backing paper, a film collecting section containing a takeup reel, and a channel-shaped intermediate section having a front wall which is provided with a light-admitting window in register with successive unexposed frames of film when the cassette is inserted into the body of a camera and the film transporting mechanism is actuated prior to the making of successive exposures. Portions of the film and backing paper extend through the intermediate section of the housing in such a way that the film is located immediately behind the window and the backing paper is located between the film and the rear wall of the intermediate section. A spring-biased pressure plate is mounted in the intermediate section between the backing paper and film so as to maintain the film behind the window in a predetermined plane. The pressure plate is biased forwardly by several resilient prongs which engage upwardly and downwardly extending projections of the pressure plate and urge such projections against abutments on the front wall of the intermediate section. The flattening action of the pressure plate upon the film is independent of the curvature and/or stiffness of backing paper in the intermediate section.

3,815,148

ELECTRICAL EXPOSURE CONTROL DEVICES FOR USE WITH A PHOTOGRAPHIC CAMERA

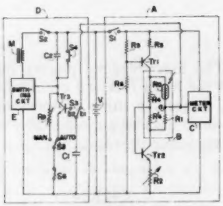
Kotaro Yata Ikeda; Yasuhiro Nanba, both of Oakai, and Masayoshi Sahara, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed July 27, 1972, Ser. No. 275,698

Claims priority, application Japan, July 27, 1971, 46-66052; Apr. 15, 1972, 47-43918

Int. Cl. G03b 7/08, 9/62

U.S. Cl. 354—24 2 Claims



In an electrical exposure control device for use with reflex type photographic cameras, the voltage stored in a storage device is accurately retained after the light has been detected by a light receptive element and prior to the use of the stored voltage for purposes of exposure control by structure which ensures that the required switching of the stored voltage is coincidentally timed with the actual movement of the shutter mechanism to initiate an exposure, thereby eliminating unwanted decay between operation of a change-over switch and actual movement of the shutter mechanism.

3,815,149

FINDER ATTACHMENT FOR CAMERAS

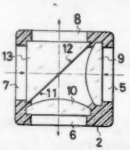
Kazuo Ishihara, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 24, 1972, Ser. No. 309,293

Claims priority, application Japan, Dec. 3, 1971, 46-114416

Int. Cl. G03b 13/04, 13/08

U.S. Cl. 354—223 9 Claims



A finder block comprises a condenser lens, an image-forming lens with its optical axis intersecting the optical axis of the condenser lens approximately at right angles, a first reflecting plane for reflecting incident light on the condenser lens toward the image-forming lens, a second reflecting plane formed on the rear face of the first reflecting plane, a second incidence window for the second reflecting plane, and a second eyepiece window for viewing an image reflected from the second reflecting plane. A support member, shiftably attached to the camera main body, can support the finder block on the camera at the objective side or eyepiece side of the camera finder or at a position other than these positions as desired.

ERRATA

For Classes 357—30, 357—43, 357—22 and 357—58 see: Patents Nos. 3,814,992 thru 3,814,997

3,815,150

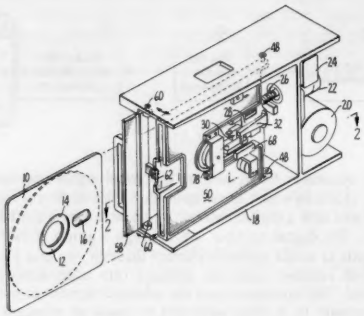
FLEXIBLE DISC DRIVE

David L. Stoddard, Los Gatos; Frank M. Balbas, Campbell; David A. Brown, and James T. Hook, both of San Jose, all of Calif., assignors to Memorex Corporation

Filed June 23, 1972, Ser. No. 265,628

Int. Cl. G11b 5/82

U.S. Cl. 360—97 4 Claims



A disc drive for flexible disc cartridge magnetic recording. The disc cartridge is placed in a holder without touching either the recording head or the disc drive spindle. Then the holder is pivoted generally parallel to the spindle axis to move the disc into engagement with the head and spindle. A special clamp on the holder clamps the disc to the spindle with a floating clamp member which can adapt itself to the axis of rotation of the spindle.

ERRATA

For Classes 360—113 and 360—41 see: Patents Nos. 3,814,863 and 3,815,108

3,815,151

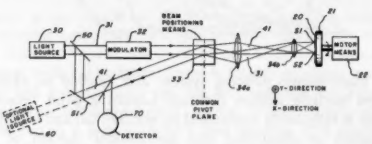
OPTICAL MEMORY WITH READOUT BEAM ANNEAL

Francis M. Schmit, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 9, 1973, Ser. No. 377,466

Int. Cl. G11b 7/00

U.S. Cl. 360—114 7 Claims



Information is stored on a manganese bismith film having low and high temperature crystallographic phases. Greatly reduced readout signal level variation due to crystallographic phase changes is achieved by magneto-optically reading out information with a light beam having an intensity sufficient to temporarily heat a bit to a temperature at which at least a portion of the high temperature phase in the bit is removed by transformation back to the low temperature phase. The readout beam does not, however, have an intensity sufficient to heat the bit to a temperature above the low temperature phase Curie temperature.

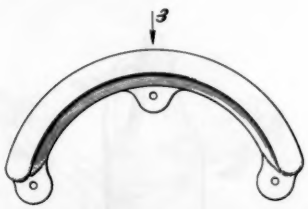
DESIGNS

JUNE 4, 1974

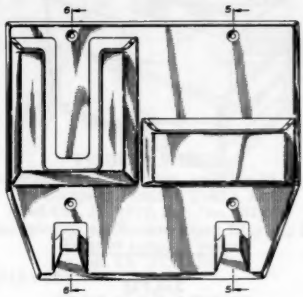
231,716
CONFECTION STICK
John F. Severson, Federal Bldg., Bismark, N.D. 58501
Filed Apr. 18, 1972, Ser. No. 245,290
Term of patent 14 years
Int. Cl. D1—*99*
U.S. Cl. D1—99

231,717
COMBINED HEEL AND SOLE FOR FOOTWEAR
William Gottlieb, Davenport, Iowa, assignor to Chromally American Corporation, St. Louis, Mo.
Filed Sept. 14, 1972, Ser. No. 290,181
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

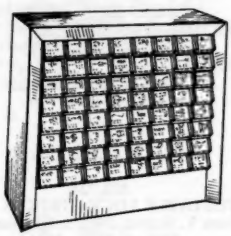
231,718
WALL-MOUNTED POT LID HOLDER OR THE LIKE
Leslie W. Eade, Box 27, Hana, Maui, Hawaii 96713
Filed Aug. 14, 1972, Ser. No. 280,555
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114



231,719
IRONING ACCESSORIES HOLDER
Richard D. Dilyard, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed June 29, 1972, Ser. No. 267,633
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—130

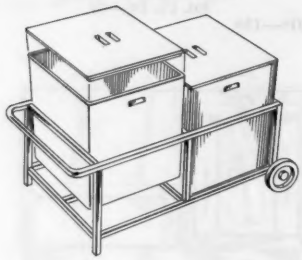


231,720
COMBINED DISPENSING AND DISPLAY STAND FOR MERCHANDISE
Max Julius Wolff, Nidau, Switzerland, assignor to Saphirwerk AG Nidau, Nidau, Canton of Berne, Switzerland
Filed Mar. 7, 1969, Ser. No. 16,131
Claims priority, application Switzerland Sept. 18, 1968
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—189

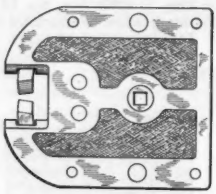


231,721
INFANT FEEDING FORK OR THE LIKE
Karl Henry Pearson, Jr., R.D. 1, Prosperity, Pa. 15329
Filed Jan. 18, 1973, Ser. No. 324,775
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—141

231,722
COMBINED TRASH RECEPTACLES AND CART THEREFOR
Harold Ray Mockler, 4803 E. Hayhurst, Tucson, Ariz. 85712
Filed Nov. 20, 1972, Ser. No. 307,995
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—191

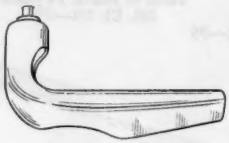


231,723
VEHICLE DOOR LOCK
John V. Pastva, Jr., Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio
Filed May 18, 1973, Ser. No. 361,621
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—109

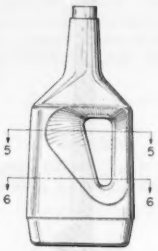


231,724
ADJUSTABLE LOCK STRIKER PLATE
Glenn V. Searer, 3401 S. Nappanee St., Elkhart, Ind. 46514
Filed Oct. 31, 1972, Ser. No. 302,514
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—117

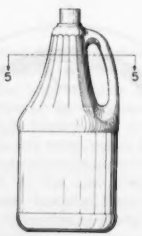
231,725
HANDLE FOR DOORS AND WINDOWS
Gianfranco Frattini, 2 Via Lanzone, 20100 Milan, Italy
Filed Sept. 22, 1972, Ser. No. 291,414
Claims priority, application Switzerland Mar. 23, 1972
Term of patent 7 years
Int. Cl. D8—*06*
U.S. Cl. D8—162



231,726
JUG
Peter L. Schweizer, Liberty Center, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Jan. 15, 1973, Ser. No. 323,959
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

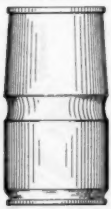


231,727
JUG
Doyle J. Morgan, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Jan. 15, 1973, Ser. No. 323,506
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—51

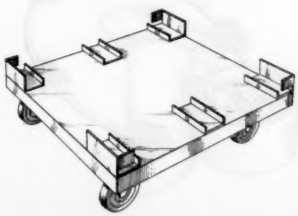


231,728
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 30, 1972, Ser. No. 316,873
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157

231,729
CAN OR SIMILAR ARTICLE
Gary Hasegawa, Chicago, and Carmen T. Mascia, Westmont, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed May 21, 1973, Ser. No. 361,920
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



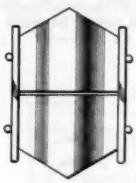
231,730
MOBILE BASE FOR A CONVECTION OVEN
Robert E. Lee, Huntington, Ind., assignor to Lincoln Manufacturing Company, Inc.
Filed Mar. 7, 1973, Ser. No. 338,665
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31

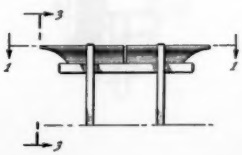


231,731
VEHICLE BODY
Paul H. Deesen, Rochester, Michael W. Lathers, Bloomfield Hills, Kent W. Madill, Oak Park, and Pierre Ollier, Bloomfield Hills, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 20, 1972, Ser. No. 308,265
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—100

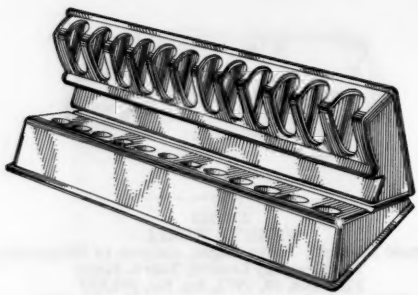
231,732
VEHICLE WHEEL
Hiroshi Ishibashi, Tokyo, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Oct. 30, 1972, Ser. No. 302,037
Claims priority, application Japan May 27, 1972
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

231,733
SHELTER STRUCTURE
Don G. Murphy, 413 S. Santa Anita Ave., Pasadena, Calif. 91107
Filed Feb. 22, 1972, Ser. No. 228,424
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 D

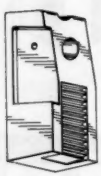




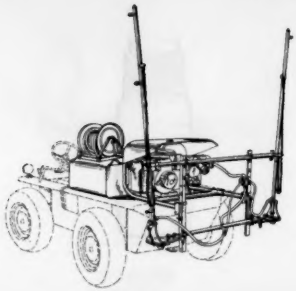
231,734
TEST TUBE RACK
Jose F. Sendra and Joaquim Fernandes, Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Mar. 21, 1973, Ser. No. 343,542
Term of patent 14 years
Int. Cl. D24—*02*; D6—*99*
U.S. Cl. D16—1 A



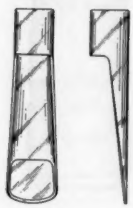
231,735
BREECHBLOCK
James L. Riedl, Laguna Niguel, Calif. (15124 Weststate, Westminster, Calif. 92683)
Filed Nov. 6, 1972, Ser. No. 303,727
Term of patent 14 years
Int. Cl. D22—*99*
U.S. Cl. D22—7



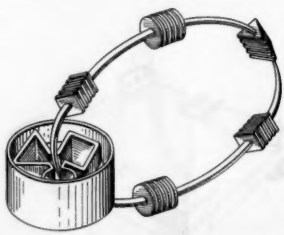
231,736
MOBILE SPRAYER
Roy F. Broyhill, Dakota City, Nebr. 68731
Filed Feb. 11, 1972, Ser. No. 225,701
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



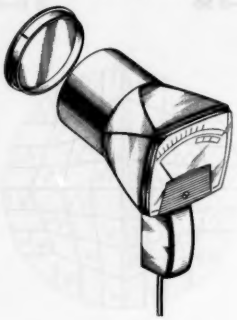
231,737
SURGICAL EXAMINATION MIRROR OR SIMILAR ARTICLE
Terry F. Tanner, St. Petersburg, Fla., assignor to Concept, Inc., St. Petersburg, Fla.
Filed July 9, 1973, Ser. No. 377,729
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D



231,738
EDUCATIONAL GEOMETRY RING
Robert Brass, 1 Fillow St., Westport, Conn. 06880
Filed Aug. 10, 1972, Ser. No. 279,639
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R



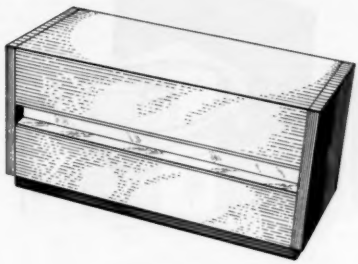
231,739
REFLECTOMETER
Armond L. Gauthier, Studio City, Calif., assignor to Redkin Laboratories, Inc., Van Nuys, Calif.
Filed Nov. 26, 1971, Ser. No. 202,734
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—1 Q

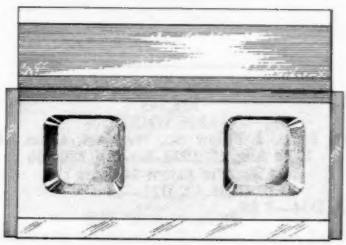


231,740
TELEPHONE INTERCOMMUNICATING UNIT
Arnold Wolf, Los Angeles, Bruce A. Buell, Walnut Creek, and William E. Howe, Orinda, Calif., assignors to Voycell, Oakland, Calif.
Filed July 3, 1972, Ser. No. 268,543
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

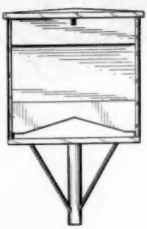
231,741
CONTROLLER GRIP FOR FORK LIFT TRUCKS OR THE LIKE
David De Witt Tompkins, Columbus, Ohio, assignor to Crown Controls Corporation, New Bremen, Ohio
Filed Sept. 1, 1972, Ser. No. 285,757
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

231,742
TELEPHONE ENCLOSURE
Donald Michael Genaro, Haworth, N.J., John Niel McGarvey, Drexel Hill, Pa., and Gordon Elliot Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 13, 1973, Ser. No. 351,082
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

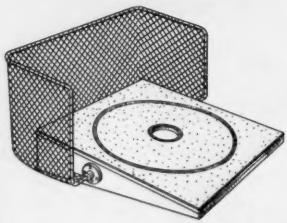




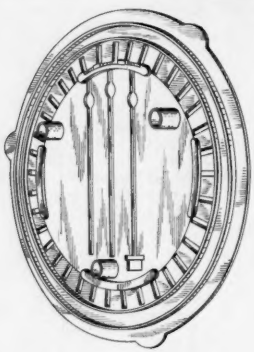
231,743
BIRD FEEDER
Frederick A. Nudd, 206 Lanson Road, Ontario, N.Y. 14519
Filed May 19, 1972, Ser. No. 255,312
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



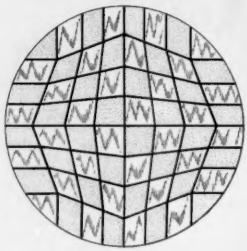
231,744
GAME TARGET
Gail H. Bailey, 14681 Donegal Drive, Garden Grove, Calif. 92644
Filed Oct. 7, 1971, Ser. No. 187,588
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



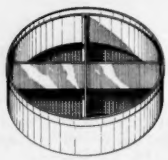
231,745
GAME WHEEL
Robert Brass, 1 Fillow St., Westport, Conn. 06880
Filed Aug. 11, 1972, Ser. No. 280,000
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



231,746
CHECKER AND CHESSBOARD
David Aiuppa, W207 S8286 Hillendale Drive, Muskego, Wis. 53150
Original design application Aug. 16, 1971, Ser. No. 172,368, now Patent No. 226,321. Divided and this application Sept. 5, 1972, Ser. No. 286,493
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

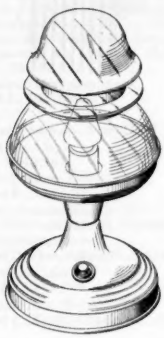


231,747
SPROUTING BOX
Gary L. Davis, 736 East 650 South, Centerville, Utah 84014
Filed Dec. 11, 1972, Ser. No. 313,808
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

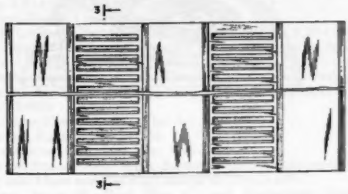


231,748
CULTIVATOR TINE
Ary van der Lely, 10 Weverskade, Maasland, Netherlands, and Cornelis Johannes Gerardus Bom, 36 Esdoornlaan, Rozenburg, Netherlands
Filed Apr. 6, 1972, Ser. No. 241,893
Claims priority, application Switzerland Dec. 14, 1971
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E

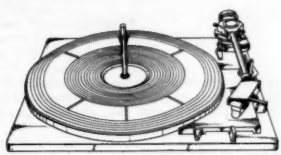
231,749
ELECTRIC LAMP, OR SIMILAR ARTICLE
David E. Maciel, 262 Round St., Taunton, Mass. 02780
Filed Mar. 24, 1972, Ser. No. 238,024
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C



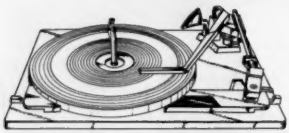
231,750
GRILLE
Patrick Zampetti, 13 Van Buren Ave., and Robert Deuchler, 15 Hawthorne St., both of Cranford, N.J. 07016
Original design application Mar. 5, 1970, Ser. No. 21,774, now Patent No. 222,843, dated Jan. 11, 1972. Divided and this application Jan. 25, 1971, Ser. No. 109,725
Term of patent 14 years
Int. Cl. D25—*02*; D23—*03*
U.S. Cl. D54—2 A



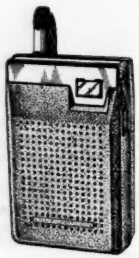
231,751
RECORD PLAYER
Hanji Takahashi and Ryoichi Takeoka, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed July 31, 1972, Ser. No. 276,607
Claims priority, application Japan Jan. 31, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



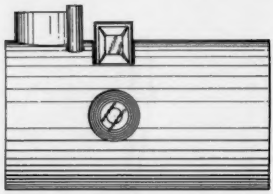
231,752
RECORD PLAYER
Hanji Takahashi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed July 31, 1972, Ser. No. 276,610
Claims priority, application Japan Jan. 31, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



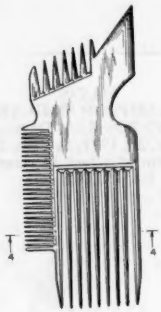
231,753
RADIO RECEIVER
Tomio Fujiwara, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 2, 1972, Ser. No. 277,197
Claims priority, application Japan Feb. 4, 1972
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



231,754
CAMERA
Jerold Karel, 8847 N. Merrill Ave., Niles, Ill. 60648
Filed July 27, 1972, Ser. No. 275,709
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



231,755
COMB
Carl A. Nico, 6812 18th Ave., Brooklyn, N.Y. 11204
Filed Mar. 29, 1973, Ser. No. 346,086
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JUNE, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. P. V. Company Limited, The: *See*—
Shore, David Teignmouth, 3,814,172.

Aarons, Geoffrey L.; and DeWeese, Ralph M., to International Harvester Company. Cushion hitch. 3,814,411, Cl. 267-63.000.

AB Motala Verkstad: *See*—
Carlsson, Bengt J., 3,814,787.

Abbe, Robert C., to Ade Corporation. Apparatus for indicating an object reversal of direction. 3,815,111, Cl. 340-213.00r.

Abbott, Edward George, to British Leyland Austin-Morris Limited. Vehicle seats. 3,814,476, Cl. 297-379.000.

Abe, Katsuo: *See*—
Mitobe, Koichi; and Abe, Katsuo, 3,814,976.

Abe, Toshio, to Konishiroku Photo Industry Co., Ltd. Photo-electric densitometer. 3,814,523, Cl. 356-202.000.

Abrahamer, Salek. Sliding coupling for propeller shafts. 3,813,899, Cl. 64-23.000.

Ace, Ronald S., to Ace Sophisticates Incorporated. External photodetector cooling techniques. 3,814,964, Cl. 313-39.000.

Ace Sophisticates Incorporated: *See*—
Ace, Ronald S., 3,814,964.

ACF Industries, Incorporated: *See*—
Winkley, Jerry H., 3,814,390.

Acs, Steven N., to Allied Chemical Corporation. Heat and kinetic absorption lining for air bag. 3,814,458, Cl. 280-150.0ab.

Acuity Systems, Incorporated: *See*—
Darden, Stephen C., 3,814,942.

Adamowicz, Norman C.; Klein, Roy W.; and Tremmel, Robert A., to Oxy Metal Finishing Corporation, mesne. Electrodeposition of cobalt. 3,814,674, Cl. 204-43.00t.

Adams, Glen O., to General Electric Company. Motor arrangement and lubrication system for oscillatory compressor. 3,814,550, Cl. 417-417.000.

Adams, harold W., to Reynolds Metals Company. Method of forming steel supported aluminum overhead conductors. 3,813,772, Cl. 29-624.000.

Adams, Lloyd M.: *See*—
Douglas, James R.; Adams, Lloyd M.; Mycek, Edward G.; and Grafton, David A., 3,814,514.

Adams, William M. Timing circuit. 3,814,950, Cl. 307-141.000.

Addison Products Company: *See*—
Gemender, John F.; and Schwenker, Eric H., 3,813,893.

Ade Corporation: *See*—
Abbe, Robert C., 3,815,111.

Adkins, William J.; and Carter, Charles N., to Corning Glass Works. Priority interrupt system. 3,815,105, Cl. 340-172.500.

Adler, Franklin P., to Pullman Transport Leasing Company. Freight car with depressed center section. 3,814,028, Cl. 105-366.00r.

Adler, Karl; and Ducommun, Georges, to Biviator S.A. Method and apparatus for measuring the critical flicker fusion frequency. 3,814,510, Cl. 351-36.000.

Admiral Marine Products Company: *See*—
Hamburg, Jacob J., 3,813,708.

Adoram, Avner: *See*—
Anati, Reuven; and Adoram, Avner, 3,814,932.

Advance Enterprises, Inc.: *See*—
Faltin, Hans G., 3,813,981.

Advanced Extrusions Limited: *See*—
Habash, Michael B., 3,814,040.

Aerochem Research Laboratories, Inc.: *See*—
Miller, William John; and Calcote, Hartwell Forrest, 3,814,583.

Aerojet-General Corporation: *See*—
Klager, Karl; and Dekker, Albert O., 3,814,694.

Aerospace Lubricants, Inc.: *See*—
Christian, John B., 3,814,689.

AFA Protective Systems, Inc.: *See*—
Caretto, Howard L.; Cook, Charles W.; and Johnson, Gustave A., 3,815,093.

Aftreth, Owren J.: *See*—
Brown, Howard R.; and Aftreth, Owren J., 3,813,838.

Agar, Joram, to Agar, Joram, & Company, Limited. Apparatus for controlling the withdrawal from a conduit of the leading one of two successive volumes of fluids passing therethrough. 3,813,924, Cl. 73-53.000.

Agar, Joram, & Company, Limited: *See*—
Agar, Joram, 3,813,924.

Agfa-Gevaert AG: *See*—
Wick, Richard; and Winkler, Alfred, 3,815,147.

Agrati, Franco, to Grati-Garelli S.p.A. Method for the formation of connection sleeves. 3,814,891, Cl. 219-67.000.

Ahne, Jerome J., to Allis-Chalmers Corporation. Electronic draft load sensing system. 3,814,188, Cl. 172-7.000.

Ahrens, Wilhelm; Lea, Hans; Rohm, Fritz; and Straehle, Heinz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Apparatus for dosing and mixing liquid or solid materials for dental purposes. 3,814,387, Cl. 259-72.000.

Aichi Steel Works, Limited: *See*—
Fukui, Hiroshi; Iwatsu, Gakuji; and Kato, Junichi, 3,814,410.

Aiken, Howard H. Thermal recorder having analogue to digital converter. 3,815,144, Cl. 346-35.000.

Ainsworth, Glenn C.; and Schneider, Marion F., to United States of America, Air Force. Portable hand held dosimeter. 3,814,940, Cl. 250-389.000.

Air Preheater Company, Inc., The: *See*—
Fanton, Ralph E., 3,814,036.

Air Products and Chemicals, Inc.: *See*—
Allam, Rodney John; Bligh, Bernard Ramsey; and Gaumer, Lee S. (said Allam and said Bligh assors. to), 3,813,889.
Geist, Jacob M.; Paul, Roy A.; and Thorogood, Robert M., 3,814,397.
Green, Harold A.; and Petrella, Robert G., 3,814,764.
Klee, David J.; and Sills, John T., 3,813,895.

Air Products and Chemicals, Inc., mesne: *See*—
Molina, Orlando Gomez, 3,814,695.

Air Products Limited: *See*—
Allam, Rodney John; Bligh, Bernard Ramsey; and Gaumer, Lee S., 3,813,889.

Aishin Seiki Co., Ltd.: *See*—
Nishi, Koji; Kumakura, Itsuo; and Hamaguchi, Ukio, 3,813,806.

Akaike, Seiji, to Atsugi Motor Parts Co. Ltd. Device for preventing foaming of oil. 3,814,122, Cl. 137-490.000.

Akers, Charles Amos, II; and Crewe, Stanley Carleton, to Du Pont de Nemours, E. I., and Company. Spinneret with inert gas metering ring. 3,814,559, Cl. 425-72.000.

Aktiebolaget Karlstads Mekaniski Werkstad: *See*—
Ingemarsson, Gosta Ingemar, 3,814,663.

Aktiebolaget Svenska Flaktfabriken: *See*—
Sjoqvist, Lennart S. G., 3,814,538.

Aktiebolaget Vibro-verken Solna: *See*—
Holmlund, Henrik; and Kareby, Erik, 3,814,385.

Akzona Incorporated: *See*—
Heijnis, James W. Ij., 3,813,740.

Alacchi, Georges. Travelling shoring apparatus. 3,813,886, Cl. 61-45.00d.

Albrecht, Rudolf: *See*—
Rufer, Clemens; Albrecht, Rudolf; Dessler, Hans-Joachim; and Schroder, Eberhard, 3,814,810.

Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, to Schering Aktiengesellschaft. Nitrofuryl pyrimidine derivatives. 3,814,758, Cl. 260-25.00r.

Albright & Wilson Limited: *See*—
Swales, Danvers Allin, 3,814,686.

Alfa-Laval AB: *See*—
Maehans, Vaino, 3,814,056.
Stenstrom, Lennart Arvid, 3,814,889.

Algoma Net Company: *See*—
Westrich, James L., 3,814,288.

Allam, Rodney John; Bligh, Bernard Ramsey; and Gaumer, Lee S., to Air Products Limited and said Allam and said Bligh assors. to Air Products and Chemicals, Inc. Separation of gas mixtures. 3,813,889, Cl. 62-22.000.

Allen, Alfred E., Jr.: *See*—
Gilmartin, Earl J., Jr.; Allen, Alfred E., Jr.; and Meeder, Donald R., 3,814,825.

Allen, Charles H.; and Smith, Willfred F., to Battelle Development Corporation. Fluid extractors. 3,814,130, Cl. 137-625.280.

Allen, Joseph C., to Texaco Inc. Secondary recovery for steeply dipping reservoirs combined cellar and attic flooding. 3,814,186, Cl. 166-272.000.

Allen, Melvin O. Voltage monitoring system and process. 3,815,062, Cl. 335-152.000.

Allen, Ronald Noel; and Potter, Ernest William, to Sykes, Henry, Limited. Well-points for de-watering ground. 3,814,184, Cl. 166-230.000.

Alliance Tool & Die Corporation: *See*—
Weber, John L.; and Klimas, George C., 3,813,825.

Allied Chemical Corporation: *See*—
Acs, Steven N., 3,814,458.
Marshall, Robert Moore; Pak, Sung Kun; and Dardoufas, Kimon Constantine, 3,814,627.

Allied Products Corporation: *See*—

Dougherty, John S., 3,813,833.
Allis-Chalmers Corporation: *See—*
Ahne, Jerome J., 3,814,188.
Maloney, Joseph H., 3,814,026.
McDermott, William C., 3,813,858.
Allnutt, Anthony John; Biddles, Barry John; and Brook, Richard Anthony, to Sira Institute. Apparatus for automatic inspection of materials. 3,814,945, Cl. 250-571.000.
Allweiler AG: *See—*
Volz, Hermann, 3,814,557.
Almasi, George S., to International Business Machines Corporation. Cylindrical magnetic domain display system. 3,815,107, Cl. 340-174.0yc.
Alps Electric Co. Ltd.: *See—*
Aoki, Masatsugu, 3,815,076.
Alvarez, William: *See—*
Strauss, Martin L.; Borsuk, Philip; and Alvarez, William, 3,814,013.
Alvarez, William, to Jonathan Manufacturing Company. Pressure switch with diaphram and adjustible contact. 3,814,877, Cl. 200-83.00n.
Ambac Industries, Incorporated: *See—*
Nelson, Isaac Hilton; and Spinks, Heyward Taylor, 3,814,961.
Amchem Products, Inc.: *See—*
Waldrum, John E., 3,814,322.
Amdahl Corporation: *See—*
Spannagel, Ulrich, 3,814,925.
American Can Company: *See—*
Humphreys, Robert Lee; and Spitzer, James Edward, 3,814,534.
La Croce, Leonard Thomas; and Radtke, Charles Stephan, 3,814,277.
Van Alsburg, Earl Roger, 3,813,972.
American Cyanamide Company: *See—*
Nagy, Daniel Elmer, 3,814,742.
American Home Products Corporation: *See—*
Herbst, David R.; and Smith, Herchel, 3,814,773.
McGettigan, Marian M., 3,814,747.
Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., 3,814,761.
Santilli, Arthur A., 3,814,762.
Wei, Peter H. L., 3,814,759.
American Hospital Supply Corporation: *See—*
Clark, John A.; and Wells, Warren A., 3,814,522.
Nilles, John D.; and Hruby, Frank R., 3,813,782.
American Manufacturing Company: *See—*
Ramstetter, Rudolf, 3,814,309.
American Optical Corporation: *See—*
Berkovits, Barouh V., 3,814,106.
Schauweker, George H.; and Dostourian, Harry, 3,813,734.
American Playground Device Co.: *See—*
Henning, Steven A., 3,814,418.
American Standard Inc.: *See—*
Fowell, Andrew J., 3,813,707.
Ameron, Inc.: *See—*
Beemer, Paul K.; and Huck, George E., 3,814,374.
Ametek, Inc.: *See—*
Daubman, Edward A.; and Sherlock, John W., 3,814,260.
Ammco Tools, Inc.: *See—*
Mitchell, Wallace F., 3,813,970.
Amoco Production Company: *See—*
Holman, George B., 3,814,187.
AMP Incorporated: *See—*
Brehm, Ronald Carl; and Over, William Roderick, 3,813,915.
Amron Research and Development Corporation: *See—*
Lawrence, Willis Thompson; and Spaulding, David B., 3,814,905.
Amsler, Max. Apparatus for the continuous temporary storage of measurement values. 3,815,142, Cl. 346-21.000.
Amsler, Max. Vehicle tachograph. 3,815,143, Cl. 346-21.000.
Analytical Products, Inc.: *See—*
Smernoff, Ronald B., 3,814,255.
Anati, Reuven; and Adoram, Avner, to Scientific Technology Limited. Multicolor textile pattern translator. 3,814,932, Cl. 250-226.000.
Andersen, Dan A., to Sherman Supersonic Industries Western, Inc. Apparatus for selective application of liquid wax to vehicles. 3,814,053, Cl. 118-2.000.
Anderson, Albert E., to Pervel Industries, Inc. Processing of expanded-plastic sheet material. 3,814,644, Cl. 156-78.000.
Anderson, Bazeel B., to Anderson Laboratories, Inc. Method of and apparatus for separating moisture from solids. 3,813,928, Cl. 73-76.000.
Anderson Laboratories, Inc.: *See—*
Anderson, Bazeel B., 3,813,928.
Anderson, Robert J., to Andersons, The. Dust filter. 3,813,853, Cl. 55-96.000.
Andersons, The: *See—*
Anderson, Robert J., 3,813,853.
Andreu Batllo, Francisco Javier; and Bufill, Juan Antonio, to Andreu, Doctor, S.A. Method of eliminating or alleviating local pain with diethylaminoethyl flufenamente. 3,814,811, Cl. 424-309.000.
Andreu, Doctor, S.A.: *See—*
Andreu Batllo, Francisco Javier; and Bufill, Juan Antonio, 3,814,811.
Andrews, Edwin R.; and Horgan, Stephen W., to Richardson-Merrell Inc. Bis-basic esters of fluorene and fluorenone. 3,814,770, Cl. 260-293.560.
Anhalt, John W.; and Goodman, David S., to International Telephone and Telegraph Corporation. Electrical connector assembly. 3,815,077, Cl. 339-17.0cf.
Aoki, Masatsugu, to Alps Electric Co. Ltd. Rotary driven variable resistor. 3,815,076, Cl. 338-180.000.
Aonuma, Masashi: *See—*
Kitamoto, Tasuji; Aonuma, Masashi; and Kawaziri, Kazuhiro, 3,814,672.
Appleton Mills: *See—*
Orbison, Frank H.; and Halland, Howard M., 3,814,665.
Applied Magnetics Corporation: *See—*
Cole, Pleasant Taswell, 3,813,917.
Applied Power Industries, Inc.: *See—*
Castoe, John H., 3,814,382.
Aqua-Not, Inc.: *See—*
Roberts, Richard J.; and Kamberg, Eduard F., 3,814,544.
Arakawa, Hideyuki: *See—*
Nagoshi, Fumiya; Arakawa, Hideyuki; and Saito, Kazuo, 3,814,708.
Arakawa, Tamio; and Kuroda, Yozi, to Teijin Limited. Process for shaping aliphatic polyamide composition. 3,814,792, Cl. 264-176.00r.
Araki, Masatada, to Nippon Oil and Fats Company Limited and Showa Denko Kabushiki Kaisha. Explosive welding process. 3,813,758, Cl. 29-470.100.
Araki, Tadashi; Asano, Kiro; Kosugi, Junichi; and Tamura, Fumio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Manufacture of carbon shaped articles. 3,814,642, Cl. 156-60.000.
Archer, Peter Robert: *See—*
Baker, Lionel Richard; Archer, Peter Robert; and West, Patricia Ann, 3,814,943.
Argoudelis, Alexander D.; Bergy, Malcolm E.; and Pyke, Thomas R., to Upjohn Company, The. Antibiotics zorbonomycin and zorbonomycin B and process for the preparation thereof. 3,814,796, Cl. 424-117.000.
Aries, Robert; Dechaumet, Armand; and Dupre, Paul, to Dynachem (societe a responsibilite limitee). Device for securing a vaporizable active substance to an animal collar. 3,814,061, Cl. 119-106.000.
Arima, Kei; Kawamura, Takeshi; Tamura, Gakuzo; and Beppu, Teruhiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Antibiotic S 15-1 and process for producing the same. 3,814,795, Cl. 424-116.000.
Armstrong, Michael J.: *See—*
Baker, Richard H.; McNally, Donald E.; and Armstrong, Michael J., 3,814,474.
Arndt, Gerhard, to Elektro-Thermit GmbH. Process for making rails resistant to wear and tear. 3,813,760, Cl. 29-527.400.
Arnsteiner, Anton. Plastic material ski structure. 3,814,452, Cl. 280-11.131.
Arrow-Hart, Inc.: *See—*
Zanini, Peter, 3,814,986.
Arvin Industries, Inc.: *See—*
Craggs, Lester R., 3,814,441.
Waldspurger, Edward C., 3,814,844.
Asahi Glass Co., Ltd.: *See—*
Takahashi, Shiro; and Asao, Takeshi, 3,814,946.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Arima, Kei; Kawamura, Takeshi; Tamura, Gakuzo; and Beppu, Teruhiko, 3,814,795.
Asano, Kiro: *See—*
Araki, Tadashi; Asano, Kiro; Kosugi, Junichi; and Tamura, Fumio, 3,814,642.
Asao, Takeshi: *See—*
Takahashi, Shiro; and Asao, Takeshi, 3,814,946.
Asasa, Kiyohiko: *See—*
Nakayama, Hiroyuki; and Asasa, Kiyohiko, 3,814,703.
Aspanger Kaolin- und Steinwerke Aktiengesellschaft: *See—*
Eder, Theodor, 3,813,851.
Aspinwall, Ronald A.; and Graham, MacKellar K., to Sperry Rand Corporation. Power transmission. 3,814,251, Cl. 210-90.000.
Associated Electrical Industries Limited: *See—*
Green, Brian Noel, 3,814,936.
Associated Engineering Limited: *See—*
Bemrose, Colin Raymond; Hall, William Arthur; and Williams, Eirug Ellis, 3,813,752.
Atlantic Richfield Company: *See—*
Wostl, Wolfgang J., 3,814,148.
Atsugi Motor Parts Co. Ltd.: *See—*
Akaike, Seiji, 3,814,122.
Atsumi, Tomoo, to Matsushito Electric Industrial Co., Ltd. Interchangable record changer spindle assembly. 3,814,440, Cl. 274-10.00s.
Atwater Strong Co., Inc.: *See—*
Rinker, Carl G., 3,813,725.
August, Paul. Carburetor. 3,814,389, Cl. 261-39.00d.
Auriana, Mark, to Burndy Corporation. Electrical connector. 3,815,079, Cl. 339-46.000.
Aurora Products Corporation: *See—*
Moe, Walter, 3,814,426.
Automobiles Peugeot: *See—*
Bonnaud, Michel, 3,813,894.
Lombard, Claude Edmond; Labaune, Camille; and Neubauer, Pierre, 3,815,010.
Roger, Yves, 3,813,909.
Avco Corporation: *See—*
Cronstedt, Val, 3,814,549.

Johnson, Wallace E.; and Fraser, James H., 3,813,892.
King, Robert W., 3,813,739.

Aviram, Arieh; Haller, Ivan; Miller, Robert D.; and Young, William R., to International Business Machines Corporation. Method for controllable verying the electrical properties of nematic liquids and dopants therefor. 3,814,700, Cl. 252-408.000.

Ayers, Maurice Donald, to Metal Innovations, Inc. Apparatus for producing low oxide metal powers. 3,814,558, Cl. 425-7.000.

Ayres, Waldemar A., to Dickinson and Company. Blood plasma separator with filter. 3,814,258, Cl. 210-359.000.

Azegami, Takeo: *See—*
Kamimura, Seigoro; Imai, Masaji; and Azegami, Takeo, 3,814,259.

B & J Manufacturing Company: *See—*
Charles, Malcolm Jean; and Runge, Donald G., 3,814,163.

Babcock & Wilcox Limited: *See—*
Bejmholt, Hans, 3,814,063.

Bachmann, Andrew; and Batson, Robert E., to Loctite Corporation. Threaded articles with locking or sealing coatings. 3,814,156, Cl. 151-14.500.

Bachner, Ernst: *See—*
Listhuber, Friedrich; Fastner, Thorwald; and Bachner, Ernst, 3,814,167.

Backstein, Gunter; and Spath, Frank-Volker, to Rheinmetall GmbH. Method and system arrangement for determining the type and condition of ammunition ready for firing. 3,814,017, Cl. 102-70.20r.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Wygasch, Ewald, 3,814,799.

Baermann, Max. Magnetic closure devices. 3,813,815, Cl. 49-478.000.

Baermann, Max. Magnetic worm drive. 3,814,962, Cl. 310-103.000.

Bahmuller, Wilhelm: *See—*
Kugel, Walter, 3,814,654.

Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., to General Electric Company. Method of applying a fused silica coating to a substrate. 3,814,620, Cl. 117-93.apf.

Bailly, Robert T. Method and apparatus for testing blood coagulation. 3,814,585, Cl. 23-230.00b.

Baker, J. Howard: *See—*
Cook, Willard P.; and Baker, J. Howard, 3,813,900.

Baker, Jack H.: *See—*
List, Harold A.; and Baker, Jack H., 3,814,914.

Baker, Lionel Richard; Biddles, Barry John; and Williams, Thomas Llewellyn, to Sira Institute. Method of, and apparatus for gauging, inspecting or measuring physical properties of objects. 3,814,520, Cl. 356-71.000.

Baker, Lionel Richard; Archer, Peter Robert; and West, Patricia Ann, to Sira Institute. Method of and apparatus for analysing patterns and inspecting objects. 3,814,943, Cl. 250-550.000.

Baker, Richard H.; McNally, Donald E.; and Armstrong, Michael J., to Steelcase Inc. Detachable table arm and bookrack. 3,814,474, Cl. 297-160.000.

Balass, Valentin, to Ferag AG. Energy storage device. 3,814,213, Cl. 185-39.000.

Balbas, Frank M.: *See—*
Stoddard, David L.; Balbas, Frank M.; and Brown, David A., 3,815,150.

Balchunas, Walter C.: *See—*
Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., 3,814,620.

Baldieri, Francesco; and Borgianni, Carlo, to Snam Progetti S.p.A. Solutions for the treatment of amorphous carbon or graphite manufactured articles for improving their resistance to oxidation. 3,814,699, Cl. 252-297.000.

Baldt Corporation: *See—*
Moren, Hugh G., Jr., 3,814,347.

Baldwin Electronics, Inc.: *See—*
May, Paul L.; and Poe, Richard J., 3,815,125.

Ball Brothers Research Corporation: *See—*
Bucher, Hans R.; and Wartburg, David H., 3,814,849.

Bando Kiko Co., Ltd.: *See—*
Bando, Sigeru, 3,813,826.

Bando, Sigeru, to Bando Kiko Co., Ltd. Spindle support assembly in a glass plate edge grinding machine. 3,813,826, Cl. 51-168.000.

Bar, Hans. Warp end tying machine. 3,813,742, Cl. 28-49.000.

Barkley, John R., to Du Pont de Nemours, E. I., and Company. Heat treated ferroelastic alpha-lead strontium phosphate crystals having controlled domain wall orientation. 3,814,502, Cl. 350-150.000.

Barlow, Gordon A.; and Kramer, Norman, to Glass, Marvin, & Associates. System for operating miniature vehicles. 3,813,812, Cl. 46-244.00r.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Lorenz, Hellmut, 3,813,868.
Schippers, Heinz, 3,814,338.

Barnes, Clarence A., Jr.: *See—*
Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roay, 3,814,698.

Barnes, Dayton W.; and Chiles, Robert D., to Ja-San, Inc. Method and apparatus for making frames for strut-type garment hangers. 3,814,143, Cl. 140-81.500.

Barnett, Irvin, to Johns-Manville Corporation. Gasketing tape woven of staple glass fiber. 3,814,142, Cl. 139-420.000.

Baron, Philip N.; and Schulman, Bernie. Golf game apparatus. 3,814,438, Cl. 273-176.0fa.

Barrett, John C.; and Larson, Roger L., to Raygo, Inc. Compacting machine having variable vibration. 3,814,532, Cl. 404-117.000.

Bartholomew, James C. Audible indicator for use with fishing rod. 3,814,048, Cl. 116-67.00r.

Bartlett, Lawrence D. Spray nozzle. 3,814,326, Cl. 239-276.000.

Bartram, Nial C.: *See—*
Doyle, Edward J.; and Bartram, Nial C., 3,814,111.

Basic ethers of l-phenyl-2-(2-thienyl)ethanols: *See—*
Cross, Peter Edward; and Dickinson, Roger Peter, 3,814,750.

Basiulis, Algerd, to Hughes Aircraft Company. Cathode gun device. 3,814,974, Cl. 313-326.000.

Batson, Robert E.: *See—*
Bachmann, Andrew; and Batson, Robert E., 3,814,156.

Battaerd, Hendrik Adrian Jacobus; Clouston, John Gannon; and Moore, Philip William. Process of polymerization. 3,814,677, Cl. 204-159.220.

Battelle Development Corporation: *See—*
Allen, Charles H.; and Smith, Willfred F., 3,814,130.

Batz, James E., to Northern Illinois Gas Company. Shaft encoder for apparatus having luminous phosphor source. 3,815,126, Cl. 340-347.00p.

Bauer Bros. Co., The: *See—*
Starrett, James R., 3,814,662.

Baumstark, Leopold. Automatic fishing device. 3,813,805, Cl. 43-15.000.

Baur, Albert, to Daimler-Benz Aktiengesellschaft. Vehicle body with box-shaped hollow bearer. 3,814,457, Cl. 280-106.000.

Baxter Laboratories, Inc.: *See—*
Keilman, Michael R., 3,814,236.
Martinez, Felix Jesus, 3,814,137.

Bayer Aktiengesellschaft: *See—*
Hartmann, Peter; Redetzky, Wolfgang; Roos, Ernst; and Kempermann, Theo, 3,814,727.
Moller, Friedrich; Muhlhausen, Cornelius; and Hauptmann, Gunter, 3,814,707.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,814,756.

Beam, Paul E., Jr.; Hunt, Albert L., Jr.; and Spears, Esten W., Jr., to General Motors Corporation. Turbine cooling control valve. 3,814,313, Cl. 236-93.000.

Bean, Charles P.; and De Blois, Ralph W., to General Electric Company. Particle analyzer. 3,815,024, Cl. 324-71.0cp.

Bear Mfg. Corporation: *See—*
Hoffman, Joseph J., 3,814,210.

Beaudin, Gerald P., Jr. Novel safety swimming pool wading platform. 3,813,703, Cl. 4-172.000.

Becker, Heinz; and Steigerwald, Karl-Heinz, said Steigerwald assor. to Steigerwald Strahltechnik GmbH. Finely perforated artificial gas and water vapor pervious wrapping for foodstuffs. 3,813,731, Cl. 17-34.000.

Becker, Jean-Jacques: *See—*
Heiler, Wolfgang; Muller, Rudolf; and Becker, Jean-Jacques, 3,814,039.

Beckman Instruments, Inc.: *See—*
Robrbaugh, Donald G.; Petersen, Everett James, Jr.; Chase, Charles Peter; and Pearson, William Robert, 3,814,582.
Way, Allan S., 3,814,957.

Becton, Dickinson and Company: *See—*
Norman, David, 3,814,080.

Bedenk, William T.; and Purves, Edward R., to Procter & Gamble Company, The. Breakfast cereals containing soy material and sodium bicarbonate. 3,814,824, Cl. 426-342.000.

Beemer, Paul K.; and Huck, George E., to Ameron, Inc. Retractable casting core box with elastomeric joint seal. 3,814,374, Cl. 249-179.000.

Beet, Roy; and Skinner, Barry, to S. & E. Strauss Limited. Method and apparatus for removing connecting threads. 3,813,738, Cl. 28-1.0cs.

Beggs, Donald, to Mildrex Corporation, mesne. Stack type recuperator having a liquid seal. 3,814,174, Cl. 165-32.000.

Beierle, Frederick P. Barrel top fastener. 3,814,278, Cl. 220-60.00r.

Bejmholt, Hans, to Babcock & Wilcox Limited. Support of tube walls. 3,814,063, Cl. 122-6.00a.

Belanger, Inc.: *See—*
Belanger, James A., 3,813,829.

Belanger, James A., to Belanger, Inc. Hub structures. 3,813,829, Cl. 51-334.000.

Bell Canada-Northern Electric Research Limited: *See—*
Critchley, John Edward; and Haight, William John, 3,814,865.

Bell, Oliver A., Jr.; and Gilleland, Randall C., to Colt Industries Operating Corporation. Pulse generator and method for electrical discharge machining. 3,814,894, Cl. 219-69.00c.

Bell, Richard W., to Esso Research and Engineering Company. Thermoplastic check valve. 3,814,124, Cl. 137-525.300.

Bell Telephone Laboratories, Incorporated: *See—*
Beurrier, Henry Richard, 3,815,049.
Edington, John Edward; and Warnock, Merville Lee, 3,814,907.
Lynn, Dale Everett, 3,814,952.
MacKenzie, Donald Reeve, 3,814,365.
Marcatili, Enrique Alfredo Jose, 3,814,499.
Seidel, Harold, 3,815,040.
Smith, Peter William; and Wood, Obert Reeves, III, 3,815,047.
Steen, Douglas Rodney, 3,814,192.
Stone, Julian, 3,814,497.
Tewksbury, Stuart Keene, 3,815,033.
Tomlinson, Walter John, III; and Weber, Heinz Paul, 3,814,498.
Wang, Tse Lin, 3,814,923.

Bell Telephone Laboratories, Incorporation: *See—*
Mar, Jerry, 3,814,951.

Bell, Verna S. Permanent wave hair roller washer. 3,814,116, Cl. 134-104.000.

Bell, Vernon D., to King-Seeley Thermos Co. Method of coating a vacuum bottle. 3,813,757, Cl. 29-455.000.

Belpaume, Charles H., to Societe Anonyme dite: Innovations pour l'Elegance Masculin. Pants. 3,813,697, Cl. 2-227.000.

Beltrami, Joseph P., to ITAD Alarm Systems, Inc. Anti-hijacking vehicular alarm system with timer controlled alarm circuit. 3,815,089, Cl. 340-64.000.

Bemrose, Colin Raymond; Hall, William Arthur; and Williams, Eirug Ellis, to Associated Engineering Limited. Apparatus for manufacturing heat exchangers. 3,813,752, Cl. 29-202.00d.

Bendix Corporation, The: *See—*
Grimes, Alton O., 3,814,352.
Kirner, Ernest O., 3,815,031.
Wertheimer, Harry P., 3,814,070.

Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; and Benkoe, Erwin, 3,814,424.

Bennett, Allan I., to Westinghouse Electric Corporation. Method for controlling finished thickness of planetary-lapped parts. 3,813,828, Cl. 51-281.00r.

Bennett, William P.; and Haller, Jacob, to Programming Technologies, Inc. Automatic tape loading apparatus for cassettes and the like. 3,814,343, Cl. 242-56.00r.

Beppu, Teruhiko: *See—*
Arima, Kei; Kawamura, Takeshi; Tamura, Gakuzo; and Beppu, Teruhiko, 3,814,795.

Bereziat, Andre, 1/2 to Plastique, Astra. Pouring plug preventing fraudulent filling of containers. 3,814,273, Cl. 215-20.000.

Bergan, Kenneth N.: *See—*
Blumke, Eugene G.; and Bergan, Kenneth N., 3,815,127.

Berger, James K., to Computer Design Corporation. Mark sense card reader. 3,814,944, Cl. 250-555.000.

Berger, James K., to Pioneer Magnetics, Inc. Power inverter circuit. 3,815,009, Cl. 321-45.00r.

Berger, Josef, to Daimler-Benz Aktiengesellschaft. Protective device for electrically operated windows, especially of motor vehicles. 3,815,005, Cl. 318-466.000.

Bergy, Malcolm E.: *See—*
Argoudelis, Alexander D.; Bergy, Malcolm E.; and Pyke, Thomas R., 3,814,796.

Berkovits, Barouh V., to American Optical Corporation. Atrial and ventricular pacer having independent rate controls and means to maintain a constant AV delay. 3,814,106, Cl. 128-419.00p.

Bernardi, Luigi; Patelli, Bianca; and Temperilli, Aldemio, to Societa Farmaceutici Italia. 8,9-Didehydro-10-alkoxy-ergolenes and process of preparation thereof. 3,814,765, Cl. 260-268.0pe.

Berry, Jean-Luc: *See—*
Dardaine, Edgar; and Berry, Jean-Luc, 3,814,783.

Berry, William R.: *See—*
Schantz, Spencer C.; and Berry, William R., 3,815,082.

Bertioli, Michael Murray: *See—*
Ironside, John Michael; Hodgson, Duncan Barry; and Bertioli, Michael Murray, 3,814,913.

Bertorello, Mario, to Rotomors S.r.L. Self-centering chuck. 3,814,450, Cl. 279-4.000.

Bertrand, Pierre; and Nony, Maurice, to Comptcurs Schlumberger. Pneumatic controllers. 3,814,119, Cl. 137-86.000.

Beshara, Wadea G. Hamper for garment hangers. 3,814,008, Cl. 100-1.000.

Bespak Industries Limited: *See—*
Warren, William Edward, 3,814,297.

Bethlehem Steel Corporation: *See—*
Fradeneck, Ronald J., 3,813,943.
List, Harold A.; and Baker, Jack H., 3,814,914.

Betts, Max William; and Robinson, Frank, to Courtaulds Limited. Knitting of sleeved garments. 3,813,901, Cl. 66-189.000.

Beurrier, Henry Richard, to Bell Telephone Laboratories, Incorporated. Negative resistance oscillator with active bias resistor for preventing spurious oscillations. 3,815,049, Cl. 331-107.00r.

Beyl, Jean Joseph Alfred. Slide plate between ski boot sole and ski surface in releasing ski bindings. 3,814,454, Cl. 280-11.35c.

Bhattacharya, Ashok K., to General Electric Company. Fill gas mixture for glow lamps. 3,814,971, Cl. 313-226.000.

Biafore, John J. Safety mechanism for machine tools. 3,814,876, Cl. 200-61.58r.

Bibighaus, Fred W., to Superior Tube Company. Tube rolling mill for producing tubing with various internal configurations. 3,813,911, Cl. 72-208.000.

Biddles, Barry John: *See—*
Allnutt, Anthony John; Biddles, Barry John; and Brook, Richard Anthony, 3,814,945.
Baker, Lionel Richard; Biddles, Barry John; and Williams, Thomas Llewellyn, 3,814,520.

Bielawa, Richard L., to United Aircraft Corporation. Coaxial rotor yaw control. 3,814,351, Cl. 244-17.190.

Big Three Industries, Inc.: *See—*
Thomas, Robert, 3,813,968.

Birke, Walter; von der Eltz, Hans-Ulrich; Meininger, Fritz; Mischke, Peter; and Schon, Franz, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for one-bath dyeing and printing of textile material. 3,814,579, Cl. 8-163.000.

Birtish Leyland Austin-Morris Limited: *See—*
Abbott, Edward George, 3,814,476.

Bishop, Arthur E. Steering apparatus and method of making same. 3,813,962, Cl. 74-500.000.

Bitzan, James A., to De Zurik Corporation and Seal assembly. . 3,814,445, Cl. 277-165.000.

Biviator S.A.: *See—*
Adler, Karl; and Ducommun, Georges, 3,814,510.

Bjorklund, Leon V.; and Hubbard, Richard T. Arm exercising device. 3,814,419, Cl. 272-80.000.

Bjorkman, Harry K., Jr., to Occidental Energy Development Company, mesne. Filter/store for electric energy storage device. 3,814,630, Cl. 136-86.00a.

Blackledge, Keith: *See—*
Rushton, Harold; and Blackledge, Keith, 3,814,202.

Blake, Kenneth Allen; Haden, Billy Harper; Hendershot, William Fred; and Johnson, La Vell Rolfson, to Miles Laboratories, Inc. Method and device for the semi-quantitative determination of glucose in aqueous fluids. 3,814,668, Cl. 195-103.50c.

Blanc, Bernard: *See—*
Gibier-Rambaud, Alain; and Blanc, Bernard, 3,814,736.

Blanck, Hillard: *See—*
Prince, Martin; Blanck, Hillard; and Tarancon, Gregorio, 3,814,615.

Bledsoe, James O., Jr.; Defrer, John M.; and Johnson, Walter E., Jr., to SMC Corporation. Isomerization of ( )-trans-2,3-epoxy-cis-carne to ( )-cis-2,8-p-menthadiene l-ol. 3,814,733, Cl. 260-631.500.

Bleher, William A.: *See—*
McGrath, Ronald P.; and Bleher, William A., 3,815,108.

Bligh, Bernard Ramsay. Process of continuous distillation. 3,813,890, Cl. 62-40.000.

Bligh, Bernard Ramsey: *See—*
Allam, Rodney John; Bligh, Bernard Ramsey; and Gaumer, Lee S., 3,813,889.

Bloch, Eric F., to Eldorado Tool & Manufacturing Corporation. Chuck assembly. 3,813,827, Cl. 51-219.00r.

Blood, Ernest R.; Lichti, Robert W.; and Pierson, James A., to Caterpillar Tractor Company. Hook for excavator buckets. 3,814,269, Cl. 214-145.000.

Blum, Rudolf, to Triumph Werke Nuernberg, A.G. Repeat mechanism for a printer. 3,814,228, Cl. 197-16.000.

Blumke, Eugene G.; and Bergan, Kenneth N., to Control Data Corporation. Data entry device. 3,815,127, Cl. 340-365.00s.

Boardman, Charles Robert, to United States of America, Atomic Energy Commission. Method for interconnecting nuclear chimneys. 3,814,185, Cl. 166-247.000.

Body, Alfred C.: *See—*
Loomis, Harry J., 3,814,319.

Boeglin, Albert F.; and Chowning, Edward A., to International Minerals & Chemical Corporation. Granulation of langbeinite. 3,814,595, Cl. 71-61.000.

Boeing Company, The: *See—*
Buehler, Walter E.; and Lunden, Clarence D., 3,815,140.

Bolan, Harry H.: *See—*
Peake, Charles C.; and Bolan, Harry H., 3,813,749.

Bolex International S.A.: *See—*
Ouleva, Serge, 3,814,511.

Bonnaud, Michel, to Automobiles Peugeot and Regie Nationale des Usines Renault. Cooling apparatus for an automobile vehicle. 3,813,894, Cl. 62-181.000.

Bonnin, Noel James. Patient stretcher transport system. 3,813,712, Cl. 5-82.000.

Booker, Clyde A., Jr., to Westinghouse Electric Corporation. Elevator door cycling control. 3,814,214, Cl. 187-29.00r.

Boosen, Karl-Josef, to Lonzo Ltd. Process for making orotic acid. 3,814,763, Cl. 260-260.000.

Bopp, Cecil W. Device for holding and moving a work object. 3,814,413, Cl. 269-58.000.

Boren, William M. Playing card distribution apparatus. 3,814,436, Cl. 273-149.00p.

Borer, John J., Jr.; and Borer, Patricia O. Garment pattern weight. 3,813,727, Cl. 16-1.000.

Borer, Patricia O.: *See—*
Borer, John J., Jr.; and Borer, Patricia O., 3,813,727.

Borg-Warner Corporation: *See—*
Studtmann, George H.; and Overzet, John K., 3,815,008.

Borgianni, Carlo: *See—*
Baldieri, Francesco; and Borgianni, Carlo, 3,814,699.

Borrel, Philippe: *See—*
Bourdon, Louis; Simon, Etienne; Borrel, Philippe; and Lehureau, Jean, 3,814,702.

Borsuk, Philip: *See—*
Strauss, Martin L.; Borsuk, Philip; and Alvarez, William, 3,814,013.

Bosch, Robert, Photokino GmbH: *See—*
Reinsch, Herbert; and Riedel, Wolfgang, 3,814,512.

Bosisio, Renato G.; Wertheimer, Michael R.; and Weissfloch, Carl F. Apparatus and method for plasma generation and material treatment with electromagnetic radiation. 3,814,983, Cl. 315-39.000.

Boss, Garold D.; Crane, Vaemond H.; McBeath, Donald G.; and Thompson, Martin D., to Sperry Rand Corporation. Processor state and storage limits register auto-switch. 3,815,101, Cl. 340-172.500.

Bostic, Carlton Ray; and Davis, John Maxwell, to Du Pont de Nemours, E. I., and Company. Stabilization of polyamide. 3,814,728, Cl. 260-45.75c.

Boswell, George Albert, Jr., to Du Pont de Nemours, E. I., and Company. Process for preparing 16α-methyl-4-pregnene-3,20-dione-6,6-difluoro-17α,21-dihydroxy. 3,814,751, Cl. 260-239.55r.

Boucher, C. Wendell, to Communication Mfg. Co. Active shunt impedance for compensating impedance of transmission line. 3,814,867, Cl. 179-170.00g.

Boulton, William, Limited: *See—*
Fahey, Dennis; and Cunningham-Smith, David, 3,814,335.

Bourdon, Louis; Simon, Etienne; Borrel, Philippe; and Lehureau, Jean, to Progil. Composition for promoting the polymerization of photopolymerizable masses. 3,814,702, Cl. 252-426.000.

Bow, William J., to Foster Wheeler Corporation. Direct contact steam condenser. 3,814,398, Cl. 261-115.000.

Bower, Arnold B., Jr.; and Leighton, Joseph C., to General Electric Company. Cutting removal bit for undercutting machine. 3,814,482, Cl. 299-79.000.

Bowers, David L.; Heidtmann, Donald S.; and Harnden, John D., Jr., to General Electric Company. Solid state induction cooking appliance. 3,814,888, Cl. 219-10.490.

Boyd, William D.; Dale, Dennis L. E.; and Jones, Roy, to Ford Motor Company. Carburetor bowl vent. 3,814,392, Cl. 261-72.00r.

Braden, Vic: *See—*
Cioth, Bogusloew B., 3,814,283.

Bradley, Frank R. Telephone line characteristic measuring instrument. 3,814,868, Cl. 179-175.30r.

Brady, John Francis; and Grill, William Augustus, to Universal Technology Inc. Reflecting lens array. 3,814,504, Cl. 350-167.000.

Brakebill, Harold G.: *See—*
Puster, Louis M.; Lewis, Jay L.; and Brakebill, Harold G., 3,814,311.

Braun AG: *See—*
Cobarg, Claus Christian, 3,813,774.

Bredeson, Dean K.: *See—*
Slaby, Robert K.; and Bredeson, Dean K., 3,814,563.

Brehm, Ronald Carl; and Over, William Roderick, to AMP Incorporated. Bench mounting and actuating apparatus for hand tool. 3,813,915, Cl. 72-407.000.

Brent, Jerome J.: *See—*
Van Handel, Ambrose B.; and Brent, Jerome J., 3,813,777.

Brewer, Joe E., to Westinghouse Electric Corporation. Analog to digital converter. 3,815,124, Cl. 340-347.0ad.

Brewer, John C., to Garbalizer Corporation of America. Hydropulper and classifier equipment. 3,814,336, Cl. 241-79.100.

Brezosky, Bernard J., to General Electric Company. Angled levelling foot for domestic appliance. 3,814,363, Cl. 248-188.400.

Bridgestone Tire Company Limited: *See—*
Honda, Toshio; Kobota, Eishi; Tanaka, Shoji; and Fukuura, Yokio, 3,814,713.

Bridigum, Robert J.: *See—*
Coiner, Ronald W.; Bridigum, Robert J.; and Brown, Donald, 3,814,483.

Brigestone Tire Company Limited: *See—*
Mauramatsu, Tateo, 3,814,468.

Briggs, Eugene C.: *See—*
Carnahan, John T.; and Briggs, Eugene C., 3,814,531.

Bristol-Myers Company: *See—*
Gordon, Maxwell, 3,814,809.
Granatek, Edmund Stanley; Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,814,800.
Naito, Takayuki; Okumura, Jun; and Kamaxhi, Hajime, 3,814,755.

British Iron and Steel Research Association, The: *See—*
Voice, Ernest Wallace; and Hawkes, David Alec, 3,814,596.

British Leyland Truck and Bus Division, Limited: *See—*
Rushton, Harold; and Blackledge, Keith, 3,814,202.

British Steel Corporation: *See—*
Goodchild, Keith Trevor; and Merrill, Harold Edward, 3,813,973.

Britton, James E.; Welch, John A.; and Hein, Richard D., to General Tire & Rubber Company, The. Elastomeric vibration isolation pad. 3,814,412, Cl. 267-152.000.

Brochetti, Raymond E., to Hunter, James, Machine Company, Inc., mesne. Bed beam guide for needle punching machine. 3,813,741, Cl. 28-4.00r.

Brock, Alan James, to Repco Research Pty. Ltd. Electrostatic copier. 3,814,517, Cl. 355-3.00r.

Brock, George W.; McCormick, Wayne; and Smith, Sidney H., to International Business Machines Corporation. Process for manufacture of a magnetic transducer using a pre-existing unitary foil. 3,813,766, Cl. 29-603.000.

Brockhurst, Woodrow W., to Luxaire, Inc. Gas burner mounting arrangement. 3,814,576, Cl. 431-354.000.

Brody, Leo L., to Trojan Luggage Company, The. Collapsible foot locker or trunk. 3,814,220, Cl. 190-19.000.

Brondberg, Arne. Method of manufacturing a colostomy, ileostomy or ureterostomy. 3,814,648, Cl. 156-253.000.

Brook, Richard Anthony: *See—*
Allnutt, Anthony John; Biddles, Barry John; and Brook, Richard Anthony, 3,814,945.

Brooks, Conrad Stone: *See—*
Hirst, Richard William; and Brooks, Conrad Stone, 3,814,200.

Brooks, Herman H.: *See—*
Phillips, David T.; Brooks, Herman H.; Wyatt, Philip J.; and Liu, Chelcie B., 3,815,000.

Brooks, Irving M.: *See—*
Busta, Francis F.; and Brooks, Irving M., 3,814,820.

Brown, Curtis Leroy. Dual fluid pressure motor. 3,813,992, Cl. 91-189.000.

Brown, David A.: *See—*
Stoddard, David L.; Balbas, Frank M.; and Brown, David A., 3,815,150.

Brown, Donald: *See—*
Coiner, Ronald W.; Bridigum, Robert J.; and Brown, Donald, 3,814,483.

Brown, Howard R.; and Aftreth, Owren J. Building construction gasket. 3,813,838, Cl. 52-396.000.

Brown, Lloyd H.; and Stephans, Larry C., to Quaker Oats Company, The. Core box. 3,814,626, Cl. 117-138.80a.

Brown, William R., to Mallory, P. R., & Co. Cam-actuated timer switch. 3,814,874, Cl. 200-38.00b.

Browne, Denis Anthony: *See—*
Croft, Brian Hugh; and Browne, Denis Anthony, 3,814,069.

Browning, Jhonce Nelson, to FMC Corporation. Regeneration of spent alumina. 3,814,701, Cl. 252-412.000.

Bruckner, James V.: *See—*
Stoltz, James P.; Bruckner, James V.; and Yingst, Thomas O., 3,814,282.

Bruder, Werner; and Grieb, Hubert, to Motoren-und Turbinen-Union Munchen GmbH, mesne. Gas turbine for series or parallel operation, subdivided into at least two sections with parallel axels. 3,813,874, Cl. 60-39.150.

Bruderer, Werner: *See—*
Knell, Bernhard; and Bruderer, Werner, 3,814,169.

Brunner, Mathias: *See—*
Nopper, Peter; Zumbach, Heinz; and Brunner, Mathias, 3,815,017.

Brunswick Corporation: *See—*
Reid, Raymond R.; and Lanpheer, Richard A., 3,813,880.

Bryntse, Anders Ivar. Fork lift truck. 3,814,456, Cl. 280-43.120.

Buchel, Karl Heinz: *See—*
Draber, Wilfried; Timmler, Helmut; Buchel, Karl Heinz; and , 3,814,802.

Bucher, Hans R.; and Wartburg, David H., to Ball Brothers Research Corporation. Leakage current compensating curcuit for semiconductor image sensor. 3,814,849, Cl. 178-7.200.

Buchwald, Robert M., to General Motors Corporation. Coolant temperature responsive exhaust crossover valve system. 3,814,071, Cl. 123-122.00h.

Buck, Herman R. Compactor for soil and the like with improved vibrator assembly. 3,814,533, Cl. 404-133.000.

Buck, James R., to Buck Tool Company. Hydraulic chuck. 3,814,448, Cl. 279-1.00j.

Buck, James R., to Buck Tool Company. Hydraulic ring chuck. 3,814,449, Cl. 279-1.00j.

Buck Tool Company: *See—*
Buck, James R., 3,814,448.
Buck, James R., 3,814,449.

Buedel, Charles K.: *See—*
Vrba, James J.; and Buedel, Charles K., 3,814,859.

Buehler, Walter E.; and Lunden, Clarence D., to Boeing Company, The. Multiple feed for microwave parabolic antennas. 3,815,140, Cl. 343-779.000.

Buerman, James T.: *See—*
Lumby, Donovan H.; Buerman, James T.; and Korzenowski, James P., 3,814,007.

Bufill, Juan Antonio: *See—*
Andreu Batllo, Francisco Javier; and Bufill, Juan Antonio, 3,814,811.

Bulk Material scraper: *See—*
Fischer, Gerhard; and Strucker, Gunter, 3,814,268.

Bunker Ramo Corporation: *See—*
Johnston, Samuel Andrew, 3,815,075.
Parks, Howard Lee, 3,813,773.

Burd, Samuel: *See—*
Fettel, Bruce E.; and Burd, Samuel, 3,814,103.

Burgbacher, Martin, to Papst-Motoren KG. External rotor-type electric motor. 3,814,960, Cl. 310-67.000.

Burket, Richard A.; Fleer, Thomas P.; Smith, Carl A.; and Love, John J., to Emerson Electric Co. Combined pilot burner and thermocouple device. 3,814,634, Cl. 136-218.000.

Burlington Industries, Inc.: *See—*
Leach, Jack; Zoufaly, Jerome; and Fash, William G., 3,814,016.
Sookne, Arnold M., 3,813,715.

Burndy Corporation: *See—*
Auriana, Mark, 3,815,079.

Burns, Kenneth S.: *See—*
Prince, Arthur E., Jr.; and Burns, Kenneth S., 3,814,793.

Burroughs Corporation: *See—*
Hunter, James R.; Lazzarotti, S. James; and Kelly, Edward A., Jr., 3,814,415.
Wojtowicz, Edward A., 3,813,953.

Busch, Wolfram; and Mullner, Stefan, to Chemische Werke Albert Aktiengesellschaft. Thermosetting moulding compositions. 3,814,718, Cl. 260-32.60r.

Bush, George W.: *See—*
Szabo, Marton; and Bush, George W., 3,813,729.

Busta, Francis F.; and Brooks, Irving M., to Salad Supreme Incorporated. Fruit and vegatable contact with chlorine containing boicides and discoloration inhibitors. 3,814,820, Cl. 426-262.000.

Butler, Robert W.: *See—*

Schwartz, William F.; and Butler, Robert W., 3,815,122.

Buxton, Robert J.: *See—*
Pepper, William B., Jr.; and Buxton, Robert J., 3,814,355.

Buzza, Thomas. Drop light. 3,814,927, Cl. 240-54.00a.

Bylund, Linton D., to Raynolds Metals Company. Aluminous metal articles and aluminum base alloys. 3,814,590, Cl. 29-183.000.

Cahour, Maurice Alphonse Jules; Le Trung, Truc; and Signoret, Lucien Gaston, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Support for rubber and like pipes and hoses. 3,814,565, Cl. 425-392.000.

Cake, Arthur F., to Wagner Electric Corporation. Variable interval timer circuit. 3,814,954, Cl. 307-293.000.

Calcote, Hartwell Forrest: *See—*
Miller, William John; and Calcote, Hartwell Forrest, 3,814,583.

Callahan, Paul J. Toy plastic boomerang. 3,814,431, Cl. 273-106.00d.

Calspan Corporation: *See—*
McHenry, Raymond R., 3,814,021.

Calvert, Corlette C.; Morgan, Neal O.; and Martin, Richard D., to United States of America, Agriculture. Separator for negatively phototactic house fly larvae from chicken hen excreta. 3,814,057, Cl. 119-15.000.

Calvin, John N., to Combustion Engineering, Inc. Staggered cone deflectors. 3,814,666, Cl. 176-78.000.

Cam Stat Incorporated: *See—*
Hewitt, William Lloyd, 3,814,991.

Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Priestley, Joseph A., to Johnson & Johnson. Trousers having narrow elastic fabric waistband. 3,813,698, Cl. 2-237.000.

Canadian Ingersoll-Rand Company, Limited: *See—*
Young, Douglas L. G., 3,814,244.

Canon Kabushiki Kaisha: *See—*
Kimura, Takehiko; Niizawa, Yoshiki; and Hirano, Reiji, 3,815,098.
Takahashi, Toru; Kadowaki, Hidejiro; and Kuge, Tsukasa, 3,814,515.

Caperton, Charles B. Coupling means for sewer rod. 3,814,529, Cl. 403-393.000.

Capital Reproductions Inc.: *See—*
Zeunen, Barthel; Grace, Rex C.; and Dunn, Alvie R., 3,814,519.

Caplan, Sidney W.; and Molson, William N., to Component Systems, Inc. Wall framing system using prefabricated panels. 3,813,832, Cl. 51-206.000.

Caporiccio, Gerardo; and Strepparola, Ezio, to Montecatini Edison S.p.A. Acrylic and methacrylic monomers, Polymers and copolymers thereof. 3,814,741, Cl. 260-86.10e.

Cappotto, Samuel D., to SCM Corporation. Stuffed ribbon cartridge. 3,814,231, Cl. 197-168.000.

Caratsch, Hans-Peter. Apparatus for applying a thermoplastic material in the form of mutually isolated deposits to a surface structure. 3,814,052, Cl. 118-60.000.

Caravello, John. Picture frame for framing and holding a plurality of pictures. 3,813,799, Cl. 40-152.000.

Caretto, Howard L.; Cook, Charles W.; and Johnson, Gustave A., to AFA Protective Systems, Inc. Signaling system utilizing frequency burst duration and absence for control functions. 3,815,093, Cl. 340-152.00t.

Carlsmith, Lawrence A., to Improved Machinery Inc. Gaseous reaction apparatus including a peripheral gas receiving chamber. 3,814,664, Cl. 162-236.000.

Carlsson, Bengt J., to AB Motala Verkstad. Method and apparatus for conveying slabs of particulate, fibrous material from a common slab forming apparatus to hot presses associated therewith. 3,814,787, Cl. 264-109.000.

Carman, Robert L., Jr.; and Rhodes, Charles K., to United States of America, Atomic Energy Commission. Laser system employing raman anti-stokes scattering. 3,815,043, Cl. 331-94.50g.

Carnahan, John T.; and Briggs, Eugene C., to Koehring Company. Articulated roller assembly. 3,814,531, Cl. 404-117.000.

Carpenter, James L. Inboard-outboard boat propelling apparatus. 3,814,047, Cl. 115-35.000.

Carraway, John B.; and Sumida, Joe T., to United States of America, National Aeronautics and Space Administration. Miniature multichannel biotelemeter system. 3,815,109, Cl. 340-207.00r.

Carrona, John J.: *See—*
Freedman, Norman S.; Horsting, Carle W.; Lawrence, Walter F.; and Carrona, John J., 3,814,633.

Carter, Charles N.: *See—*
Adkins, William J.; and Carter, Charles N., 3,815,105.

Carter, Martin L. Retractable safety belt device. 3,814,346, Cl. 242-107.200.

Cascade Pole Company: *See—*
McClain, Stephen A.; Doman, Harvey A.; and Entus, Richard D., 3,813,837.

Case, J. I., Company: *See—*
Jannson, Birger F.; and Schmitz, Albert A., 3,814,554.
Tilbury, Lawrence E., 3,814,191.

Case, Robert O., Jr.; and Page, Jerome M., to Rockwell International Corporation. Radar for automatic terrain avoidance. 3,815,132, Cl. 343-7.0ta.

Case Western Reserve University: *See—*
Kicher, Thomas P.; and Nattrass, Lawrence A., 3,814,470.

Casey, James M., to General Motors Corporation. Rotary engine gas seal lubrication system. 3,814,555, Cl. 418-99.000.

Casio Computer Kabushiki Kaisha: *See—*
Kashio, Toshio, 3,814,011.

Cass International GmbH: *See—*
Parussel, Horst, 3,814,178.

Cassibo, Vernon Edward: *See—*
Klemp, Eldon John; and Cassibo, Vernon Edward, 3,814,890.

Cassidy, Harry Eugene. Hair treatments. 3,814,110, Cl. 132-7.000.

Castoe, John H., to Applied Power Industries, Inc. Spring compressor. 3,814,382, Cl. 254-10.500.

Caterpillar Tractor Company: *See—*
Blood, Ernest R.; Lichti, Robert W.; and Pierson, James A., 3,814,269.

Catlin, William Paul; and Mogul Leisure Products Limited, to Ski and ski practice machine. . 3,814,417, Cl. 272-56.5ss.

Cavallarin, Bruno: *See—*
Palazzetti, Mario; Cavallarin, Bruno; and Villa, Giovanni, 3,815,069.

Cecchi, Remo. Machine for the mechanical picking of olives from the tree. 3,813,860, Cl. 56-328.00r.

Cecil, James B.: *See—*
Howard, William G., Jr.; and Cecil, James B., 3,815,123.

Cedarholm, Oscar R. Vehicle fuel injector. 3,814,391, Cl. 261-50.00r.

Celanese Corporation: *See—*
Gall, John S.; and Halek, George W., 3,814,786.
Prince, Arthur E., Jr.; and Burns, Kenneth S., 3,814,793.
Prince, Arthur E., Jr., 3,814,794.
Zimmerman, Daniel; and Isaacson, Robert B., 3,814,725.

Centrifugal and Mechanical Industries, Inc.: *See—*
Wilson, Peter C.; and Hughart, Robert P., 3,814,246.

Certain-Teed Products Corporation: *See—*
Swander, Kenneth D., Jr.; and Wilkins, Ronald D., 3,813,994.

Chacon, Manuel Frank, to Johnson Service Company. Overvoltage protection circuit. 3,814,987, Cl. 317-16.000.

Chamber of Mines Services (Properties): *See—*
Hinde, Adrian L., 3,813,947.

Chambers, Charles W., Jr., to Lorain Products Corporation. Amplifier circuit having a multiplicity of discrete operative states. 3,815,041, Cl. 330-207.00a.

Chang, Stephen S.; and Reddy, Boyapalle R., to Research Corporation. Potato and potato chip flavor and aroma. 3,814,818, Cl. 426-65.000.

Chapa, Hector. Medical examination table. 3,814,414, Cl. 269-323.000.

Charles, Malcolm Jean; and Runge, Donald G., to B & J Manufacturing Company. Adjustable bead seater. 3,814,163, Cl. 157-1.100.

Chase, Charles Peter: *See—*
Robrbaugh, Donald G.; Petersen, Everett James, Jr.; Chase, Charles Peter; and Pearson, William Robert, 3,814,582.

Chemische Werke Albert Aktiengesellschaft: *See—*
Busch, Wolfram; and Mullner, Stefan, 3,814,718.

Cherry, Sidney J.; and Wayland, Paul O., to Westinghouse Electric Corporation. Vacuum interrupters enclosed in vacuum housings. 3,814,881, Cl. 200-144.00b.

Chesnot, Nelly: *See—*
Darbon, Pierre Andre; Claude, Rene Louis; and Chesnot, Nelly, 3,814,287.

Chicago Lock Co.: *See—*
Kerr, William J., 3,813,906.

Chierici, Osvaldo F., to Holland Company. Uncoupling device for railroad cars. 3,814,267, Cl. 213-166.000.

Chiles, Robert D.: *See—*
Barnes, Dayton W.; and Chiles, Robert D., 3,814,143.

Chowning, Edward A.: *See—*
Boeglin, Albert F.; and Chowning, Edward A., 3,814,595.

Christian, John B., to Aerospace Lubricants, Inc. Polyflouroalkyldimethyl polysiloxane/polyol aliphatic ester greases. 3,814,689, Cl. 252-21.000.

Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., to Gulf Research & Development Company. Residue hydrodesulfurization process with catalysts whose pores have a large orifice size. 3,814,682, Cl. 208-216.000.

Christman, Robert D.; McKinney, Joel D.; and Wilson, Geoffrey R., to Gulf Research & Development Company. Hydrodesulfurization process with catalysts whose pore sizes are concentrated in a narrow range. 3,814,683, Cl. 208-216.000.

Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., to Gulf Research & Development Company. Residue hydrodesulfurization process with catalysts whose pores have a small orifice size. 3,814,684, Cl. 208-216.000.

Chromally American Corporation: *See—*
Gabriel, James M.; and Reilly, William, 3,814,598.

Chrysler Corporation: *See—*
Kissel, William R., 3,814,935.

Chugai Electric Industrial Co., Ltd.: *See—*
Shibata, Akira, 3,814,640.

Church, Ralph E., to General Electric Company. Laminated structure with insulating member formed in situ thereon and method for making same. 3,813,763, Cl. 29-596.000.

Ciba-Geigy AG: *See—*
Habermeier, Juergen; and Porret, Daniel, 3,814,775.
Hugelshofer, Paul; and Kugler, Fritz, 3,814,726.
Martin, Henry; and Drabek, Josef, 3,814,798.
Martin, Henry; and Pissiotas, Georg, 3,814,801.

Ciba-Geigy Corporation: *See—*
Seltzer, Raymond; Gordon, David A.; and Sherman, Paul D., 3,814,719.

Cincinnati Milacron Inc.: *See—*
Gough, Robert G., 3,814,729.

Cioffi, Francis J., to Squibb, E. R., & Sons, Inc. Sampling valve. 3,814,129, Cl. 137-625.110.
Cioth, Bogusloew B., to Braden, Vic. Ball collecting and feeding device. 3,814,283, Cl. 221-178.000.
Cities Service Oil Company: *See*—
Oliver, Don L., 3,814,180.
Claflin, Harry B., to Kaiser Steel Corporation. Blast furnace and method of operating the same. 3,814,404, Cl. 266-29.000.
Clark, Edward L., to Research Corporation. Article of furniture and method of forming same. 3,814,478, Cl. 297-445.000.
Clark, Harry L.; Trombley, Bertrand N.; and Eicholtz, Clara V., to Dow Chemical Company, The. Interlocking compression support member. 3,814,489, Cl. 312-111.000.
Clark, James T. Pressure reducing nozzles for pressure guns. 3,814,329, Cl. 239-426.000.
Clark, John A.; and Wells, Warren A., to American Hospital Supply Corporation. Speciment tube for microscopic examination. 3,814,522, Cl. 356-197.000.
Claude, Rene Louis: *See*—
Darbon, Pierre Andre; Claude, Rene Louis; and Chesnot, Nelly, 3,814,287.
Clearfield Machine Company: *See*—
Sholl, Samuel A., 3,814,597.
Cleaveland, Charles M., to Westinghouse Electric Corporation. Modular disconnecting switch. 3,814,887, Cl. 200-162.000.
Clemente, Stefano; and Pelly, Brian R., to Westinghouse Electric Corporation. Braking circuit for alternating current induction motor. 3,815,002, Cl. 318-209.000.
Cleveland Machine Controls, Inc.: *See*—
Jones, William M., 3,814,199.
Clouston, John Gannon: *See*—
Battaerd, Hendrik Adrian Jacobus; Clouston, John Gannon; and Moore, Philip William, 3,814,677.
Cobarg, Claus Christian, to Braun AG. Electrically operated dryshaver. 3,813,774, Cl. 30-43.900.
Cochran, Stanley Robert, to Du Pont de Nemours, E. I., and Company. Method for stringing up a rotating package holder. 3,813,864, Cl. 57-34.0tt.
Cody, Robert Autand: *See*—
Lubsen, Timothy Andrew; Patel Jayantilal Mohanbhai; and Cody, Robert Autand, 3,814,826.
Coeurderoy, Yves G., to Societe Anonyme. Grab buckets. 3,814,471, Cl. 294-70.000.
Cohen, John B.; Janson, Paul E.; and McFarland, Harold L., Jr., to Digital Equipment Corporation. Data processing system. 3,815,099, Cl. 340-172.500.
Coiner, Ronald W.; Bridigum, Robert J.; and Brown, Donald, to Westinghouse Air Brake Company. Blending valve device for combining fluid pressure and dynamic brakes. 3,814,483, Cl. 303-3.000.
Cole, Pleasant Taswell, to Applied Magnetics Corporation. Method and apparatus for measuring strip material kinetic friction. 3,813,917, Cl. 73-9.000.
Coleco Industries, Inc.: *See*—
Diemond, Joseph; and Greenberg, Leonard E., 3,813,702.
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E. Electron microscope. 3,814,356, Cl. 248-18.000.
Colgate-Palmolive Company: *See*—
Inamorato, Jack T.; Hunter, Robert T.; and Dickson, Robert E., 3,814,705.
Colgate-Polmolive Company: *See*—
Mostow, John H., 3,814,692.
Colla, Jeannine O.: *See*—
Thomas, Paul E.; and Colla, Jeannine O., 3,814,998.
Collins Radio Company: *See*—
Manke, Girard M.; Schuldt, Theodore J., Jr.; and Klein, James A., 3,814,912.
Colortronic Reinhard & Co. KG: *See*—
Jakob, Peter, 3,814,388.
Tschritter, Alfons, 3,814,296.
Colt Industries Operating Corporation: *See*—
Bell, Oliver A., Jr.; and Gilleland, Randall C., 3,814,894.
Combustion Engineering, Inc.: *See*—
Calvin, John N., 3,814,666.
Hill, Ernest C.; and Patterson, Charles T., 3,813,855.
Klumb, Ralph H.; and Hutchinson, John J., 3,814,667.
Cometto, Dante James; Morse, Jeremy Painter; Crickmer, Robert Edward; and Kirk, Irvin, to International Nickel Company, Inc. Production of powder alloy products. 3,814,635, Cl. 148-11.50r.
Cominotti, Franco, to Concast AG. Cover for casting vessels in continuous casting machines. 3,814,408, Cl. 266-39.000.
Communication Mfg. Co.: *See*—
Boucher, C. Wendell, 3,814,867.
Compagnie des Montres Longines Francillon S.A.: *See*—
Portmann, Hubert, 3,815,007.
Component Systems, Inc.: *See*—
Caplan, Sidney W.; and Molson, William N., 3,813,832.
Compteurs Schlumberger: *See*—
Bertrand, Pierre; and Nony, Maurice, 3,814,119.
Computer Design Corporation: *See*—
Berger, James K., 3,814,944.
Computer Equipment Corporation: *See*—
Palmieri, Frederick W.; and Pettingell, John S., 3,814,910.
Concast AG: *See*—
Cominotti, Franco, 3,814,408.
Knell, Bernhard; and Bruderer, Werner, 3,814,169.
Concordia Maschinen- und Elektrizitats-GmbH: *See*—
Stahle, Kurt, 3,815,057.
Consentino, Augustine V.: *See*—
Hetzer, Harry Depew; and Consentino, Augustine V., 3,814,135.
Consolidated Foods Corporation: *See*—
Kowalewski, John J., 3,813,726.
Container Corporation of America: *See*—
McGinley, Patrick; and Formica, Santo J., 3,814,239.
Continental Electronics Manufacturing Company: *See*—
Shafer, James F., 3,814,838.
Continental Oil Company: *See*—
Dahl, H. Douglas; Davis, J. Gilbert, II; and Ehlers, Peter L., 3,814,480.
Contois, Lawrence E., to Eastman Kodak Company. Electrophotographic element. 3,814,600, Cl. 96-1.600.
Control Data Corporation: *See*—
Blumke, Eugene G.; and Bergan, Kenneth N., 3,815,127.
Tate, Donald P., 3,814,924.
Cook, Charles W.: *See*—
Caretto, Howard L.; Cook, Charles W.; and Johnson, Gustave A., 3,815,093.
Cook, Christie K. Pressure relief vent. 3,814,123, Cl. 137-493.900.
Cook, Gerald H., to Polaroid Corporation. Film reel with a chordal connection slot. 3,814,344, Cl. 242-74.000.
Cook, Newell C., to General Electric Company. Process for tantallding and niobiding base metal compositions. 3,814,673, Cl. 204-39.000.
Cook, Willard P.; and Baker, J. Howard, to Scott & Williams, Inc. Pneumatic yarn feeder device for knitting machines. 3,813,900, Cl. 66-125.00r.
Cookson, Alan H.; Farish, Owen; and Gauntz, John M., to Westinghouse Electric Corporation. Circuit interrupter with improved trap for removing particles from fluid insulating material. 3,814,879, Cl. 200-144.000.
Coon, George M. Control for forced air heating and/or cooling system. 3,814,173, Cl. 165-12.000.
Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., to Olinkraft, Inc. Method for forming package. 3,813,844, Cl. 53-32.000.
Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., to Olikraft, Inc. Bathtub container. 3,814,302, Cl. 229-23.00r.
Coppola, Patrick S.; Sunderland, Luther D.; and Wildrick, Milton I., to General Electric Company. Servo system including flow voting redundant failure correcting hydraulic actuator. 3,813,990, Cl. 91-1.000.
Cords, Frederick W., to Minnesota Automotive, Inc. Hydraulic actuator. 3,813,883, Cl. 60-582.000.
Corduroy Rubber Company: *See*—
Murphy, Richard D., 3,814,270.
Cornell, Alan Ananias: *See*—
Wardill, Gordon Agar; Taube, David Carl; and Cornell, Alan Ananias, 3,814,464.
Corning Glass Works: *See*—
Adkins, William J.; and Carter, Charles N., 3,815,105.
Lawhead, Creighton M., 3,814,248.
Lawless, William N.; and Wedding, Brent M., 3,814,999.
Simms, Robert A., 3,814,977.
Cosden Oil & Chemical Company: *See*—
Wiley, Donald F., 3,814,779.
Cotswold Dairy Equipment U.S.A. Ltd.: *See*—
Van Zutphen, Clement J.; and Moran, Brian J., 3,814,291.
Coulter Electronics, Inc.: *See*—
Hogg, Walter R., 3,815,023.
Courtaulds Limited: *See*—
Betts, Max William; and Robinson, Frank, 3,813,901.
Courtot, Louis B., to Weatherhead Company, The. Hose construction. 3,814,138, Cl. 138-124.000.
Cowpland, Michael C. J., to Microsystems International Limited. Temperature stable tone generator. 3,815,050, Cl. 331-110.000.
Cox, George B., Jr.; and Huls, Ralph M., to United States of America, Air Force, mesne. Combustion device. 3,814,575, Cl. 431-352.000.
Cox, Robert James, to Pennwalt Corporation. Process for compacting fluorspar for metallurgical use. 3,814,789, Cl. 264-117.000.
Craggs, Lester R., to Arvin Industries, Inc. Recording arm safety lifter. 3,814,441, Cl. 274-23.00r.
Craig, Bryant F. Fluid mixed drink card programable dispenser. 3,814,285, Cl. 222-2.000.
Crane, Vaemond H.: *See*—
Boss, Garold D.; Crane, Vaemond H.; McBeath, Donald G.; and Thompson, Martin D., 3,815,101.
Creasey, Jack R.: *See*—
06/04/74; and Creasey, Jack R., 3,814,160.
Cree, David A., to Eastman Kodak Company. Electrophotographic transfer process. 3,814,599, Cl. 96-1.400.
Creusot-Loire Entreprises: *See*—
Maubon, Andre, 3,814,402.
Crewe, Stanley Carleton: *See*—
Akers, Charles Amos, II; and Crewe, Stanley Carleton, 3,814,559.
Crickmer, Robert Edward: *See*—
Cometto, Dante James; Morse, Jeremy Painter; Crickmer, Robert Edward; and Kirk, Irvin, 3,814,635.

Critchley, John Edward; and Haight, William John, to Bell Canada-Northern Electric Research Limited. Telephone substation apparatus for generating multi-frequency signals. 3,814,865, Cl. 179-84.0vf.

Croft, Brian Hugh; and Browne, Denis Anthony, to Lucas, Joseph, (Industries) Limited. Inlet manifolds. 3,814,069, Cl. 123-52.00m.

Crompton & Knowles Corporation: *See—*
Feeman, James F., 3,814,749.

Cronin, John C.; and Dodge, David S., to I-T-E Imperial Corporation. Low dielectic stress termination for gas-insulated transmission system. 3,814,830, Cl. 174-22.00c.

Cronin, John C., to I-T-E Imperial Corporation. Cable drawn through polymer tube within polymer housing for electrical transmission. 3,814,832, Cl. 174-28.000.

Cronin, Timothy H.; and Hess, Hans-Jurgen E., to Pfizer Inc. Piperazino quinazoline bronchodilators. 3,814,760, Cl. 260-356.40q.

Cronstedt, Val, to Avco Corporation. Gas turbine engine with power shaft damper. 3,814,549, Cl. 417-406.000.

Cross, Peter Edward; and Dickinson, Roger Peter, to Pfizer Inc. and Basic ethers of l-phenyl-2-(2-thienyl)ethanols. . 3,814,750, Cl. 260-239.00b.

Crumal, Jimmie, to Nielsen Engineering & Research Inc. Apparatus for extracting a liquid sample at various depths of a liquid stream. 3,813,945, Cl. 73-422.0tc.

Csejka, David A.; and Lederle, Henry F., to Olin Corporation. Alkyl (polyalkoxy) silanes as components in hydraulic fluids. 3,814,691, Cl. 252-78.000.

Cunningham-Smith, David: *See—*
Fahey, Dennis; and Cunningham-Smith, David, 3,814,335.

Curley, John L.: *See—*
Nibby, Chester M.; Manton, John C.; Franklin, Benjamin S.; and Curley, John L., 3,814,922.

Cutler-Hammer, Inc.: *See—*
Piber, Earl T., 3,814,886.
Schuchmann, Russell P.; Schutten, Herman P.; and Small, Isadore, III, 3,814,948.

Czaplinski, Thomas V., to Squibb, E. R., & Sons, Inc. Loading syringe for use with radioactive solutions and other non-sterile solutions. 3,814,941, Cl. 250-430.000.

Dada, Abdul G., to General Electric Company. Nozzle for chemical reaction processes. 3,814,327, Cl. 239-290.000.

Dahl, H. Douglas; Davis, J. Gilbert, II; and Ehlers, Peter L., to Continental Oil Company. Method of controlling gas accumulation in underground mines. 3,814,480, Cl. 299-2.000.

Dahlgren, Harold P. Inker. 3,814,014, Cl. 101-137.000.

Dai Nippon Printing Co., Ltd.: *See—*
Kato, Chuzo; and Kawazoe, Masashi, 3,814,790.

Daimler-Benz Aktiengesellschaft: *See—*
Baur, Albert, 3,814,457.
Berger, Josef, 3,815,005.

Dalby, Gaston: *See—*
Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roay, 3,814,698.

Dale, Dennis L. E.: *See—*
Boyd, William D.; Dale, Dennis L. E.; and Jones, Roy, 3,814,392.

Dana Corporation: *See—*
O'Brien, Loren James, 3,814,201.

Daniel, Andre Francis Albert, to Etat Francais. Safety device for percussion fuse. 3,814,018, Cl. 102-73.000.

Danner, Wilson E.: *See—*
Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., 3,813,817.
Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., 3,814,817.

Darbon, Pierre Andre; Claude, Rene Louis; and Chesnot, Nelly, to Societe Anonyme Dite: mesne. Multicompartment dispenser. 3,814,287, Cl. 222-94.000.

Dardaine, Edgar; and Berry, Jean-Luc, to Remy, E. P., et cie. Method for manufacturing sterile containers. 3,814,783, Cl. 264-89.000.

Darden, Stephen C., to Acuity Systems, Incorporated. Human head restraint system. 3,814,942, Cl. 250-456.000.

Dardoufas, Kimon Constantine: *See—*
Marshall, Robert Moore; Pak, Sung Kun; and Dardoufas, Kimon Constantine, 3,814,627.

Dargols, Bernard. Spray dispenser fitted with a demineralizing cartridge. 3,814,292, Cl. 222-189.000.

Darley, Reginald, to Scheu Manufacturing Company. Heater. 3,814,574, Cl. 431-338.000.

Datavision, Inc.: *See—*
Edwards, Philip K., 3,814,854.

Daubman, Edward A.; and Sherlock, John W., to Ametek, Inc. Knife advance mechanism. 3,814,260, Cl. 210-396.000.

Dauer, John J., Jr.: *See—*
Grunert, Kurt A.; and Dauer, John J., Jr., 3,815,063.

Dautel, John D.; O'Leary, Denis F.; and Turner, Hubbard C., Jr., to Sperry Rand Corporation. CW surveillance radar system. 3,815,131, Cl. 343-5.0pd.

Daves, Jimmy Edward. Bottle securing and dispensing apparatus. 3,814,293, Cl. 222-173.000.

Davidson, Sidney. Warning alarm for providing an alarm upon operating means being unintentionally connected to a power source. 3,815,110, Cl. 340-213.00r.

Davis, Alvin W. Tilted rotary retort industrial furnace. 3,814,401, Cl. 266-4.00a.

Davis, Charles M., Jr.; and Fox, Joseph N., to Scrap Metals, Inc. Can crusher. 3,814,009, Cl. 100-159.000.

Davis, George Bradley, Jr., to Products Engineering, Inc. Joist with nailing strip and positioning members. 3,813,834, Cl. 52-223.000.

Davis, J. Gilbert, II: *See—*
Dahl, H. Douglas; Davis, J. Gilbert, II; and Ehlers, Peter L., 3,814,480.

Davis, James Howard; and Dobson, Donald Rhea, to International Business Machines Corporation. Compromise voltage control for tracking multiple output power supply. 3,815,014, Cl. 323-20.000.

Davis, John Maxwell: *See—*
Bostic, Carlton Ray; and Davis, John Maxwell, 3,814,728.

Davis, Thomas J., to United States of America, Atomic Energy Commission. Differential amplifier circuits. 3,815,038, Cl. 330-30.00d.

Dawson, Edward C.: *See—*
Parker, Jeffrey M.; Dawson, Edward C.; and Kramer, Anthony J., 3,815,032.

DCA Food Industries, Inc.: *See—*
Smadar, Yechiel; Roth, Howard; McCarthy, John P.; and Moyer, John, 3,814,560.

De Barbieri, Augusto, to Instituto Sieroterapico Milanese "Serafino Belfanti" Ento Morale. Mannich bases of tetracyline and polypeptides. 3,814,746, Cl. 260-112.500.

De Blois, Ralph W.: *See—*
Bean, Charles P.; and De Blois, Ralph W., 3,815,024.

De La Fuente, Manuel Guadalajara. Internal combustion engine combustion chamber design and air/fuel mixture supply means. 3,814,067, Cl. 123-32.0st.

De Torre, John, to Federal Pacific Electric Company. Circuit breaker with wide opening contacts. 3,815,070, Cl. 337-59.000.

De Zuba, George P.: *See—*
Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., 3,814,722.

De Zurik Corporation: *See—*
Bitzan, James A., 3,814,445.

Dean, Carl J.; and Wright, David M., to Wright, Barry, Corporation. File drawer follower block. 3,814,490, Cl. 312-183.000.

DeAngelis, Armand; and Laliberte, Albert J., to Omnitech Inc. Low profile cold weather respirator. 3,814,094, Cl. 128-212.000.

Deaton, David W., to Deaton Medical Company. Medical suction apparatus. 3,814,098, Cl. 128-276.000.

Deaton Medical Company: *See—*
Deaton, David W., 3,814,098.

Debonnet, Alphonse. Installation for programmed dyeing of threads, ribbons and similar. 3,813,902, Cl. 68-19.100.

Dechaumet, Armand: *See—*
Aries, Robert; Dechaumet, Armand; and Dupre, Paul, 3,814,061.

Decker, Donald Leon, to Stauffer Chemical Company. Composite laminate. 3,814,658, Cl. 161-77.000.

DeCourcy, Rowland J. J., to Douglas-Rownson Limited. Conveyors. 3,814,233, Cl. 198-127.00r.

Deere & Company: *See—*
Hirst, Richard William; and Brooks, Conrad Stone, 3,814,200.
Miller, Lyle Eugene, 3,814,205.
Wood, William Robert, 3,813,861.

Deering Milliken Research Corporation: *See—*
Scarborough, Alexander A., 3,814,624.

Defrer, John M.: *See—*
Bledsoe, James O., Jr.; Defrer, John M.; and Johnson, Walter E., Jr., 3,814,733.

DeHaven, Lyman. Unidirectional ratchet wrench for vehicles. 3,813,967, Cl. 81-60.000.

Dekker, Albert O.: *See—*
Klager, Karl; and Dekker, Albert O., 3,814,694.

Delta Controls Limited: *See—*
Dent, William Barron; and Jenner-Clarke, Allan, 3,814,541.

DeLuca, Paul V., to Porta Systems Corporation. Outgoing truck extender test and monitor apparatus for central telephone equipment. 3,814,869, Cl. 179-175.000.

Demange, Philippe: *See—*
Warszawski, Bernard; Verger, Bernard; and Demange, Philippe, 3,814,631.

Demi, Roy C., to Robertshaw Controls Company. Control device having orienting means for being mounted to a fuel supply manifold. 3,814,125, Cl. 137-561.00r.

Denki Onkyo Co., Ltd.: *See—*
Masuda, Noboru; and Juroyanagi, Masasi, 3,814,956.

Dent, William Barron; and Jenner-Clarke, Allan, to Delta Controls Limited. Fluid supply apparatus. 3,814,541, Cl. 417-7.000.

Dentsply Research & Development Corporation: *See—*
Welsh, Richard E., 3,814,286.

Derc, Roman, to International Computers Limited. Train printers. 3,814,012, Cl. 101-111.000.

Derman, Karl Gustav. Sealing arrangement. 3,814,446, Cl. 277-169.000.

Dessler, Hans-Joachim: *See—*
Rufer, Clemens; Albrecht, Rudolf; Dessler, Hans-Joachim; and Schroder, Eberhard, 3,814,810.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Ahrens, Wilhelm; Lea, Hans; Rohm, Fritz; and Straehle, Heinz, 3,814,387.

Devine, George Thomas: *See—*

Mesh, Theodore Julius; and Devine, George Thomas, 3,814,934.
DeWeese, Ralph M.: *See—*
Aarons, Geoffrey L.; and DeWeese, Ralph M., 3,814,411.
Deyerle, William Minor. Drill jig for total hip propthesis. 3,814,089, Cl. 128-92.0eb.
Dhein, Rolf: *See—*
Meissner, Hans Jurgen, 3,814,709.
Di Gregorio, David; and Shell, Gerald Lynwood, to Envirotech Corporation. Aeration apparatus. 3,814,396, Cl. 261-93.000.
Di Marco, Bernard; Swain, Kenneth W.; and Kralik, Andrew J. Fuse and holder with rejection feature. 3,815,072, Cl. 337-226.000.
Di Prospero, Peter. Combination cleaning kit and gun safety device. 3,813,802, Cl. 42-1.00n.
Diamond, Harvey J., to Plasti-Vac, Inc. Vacuum forming apparatus. 3,814,562, Cl. 425-174.400.
Dick, Raymind S.; and Klitzke, Loren J., to Hoerner Waldorf Corporation. Extruder head for sealing containers. 3,814,650, Cl. 156-500.000.
Dickinson and Company: *See—*
Ayres, Waldemar A., 3,814,258.
Dickinson, Roger Peter: *See—*
Cross, Peter Edward; and Dickinson, Roger Peter, 3,814,750.
Dickson, Frederick Stoever, III; and Williams, Warren Lee, to Du Pont de Nemours, E. I., and Company. Yarn winding apparatus. 3,814,341, Cl. 242-35.50r.
Dickson, Robert E.: *See—*
Inamorato, Jack T.; Hunter, Robert T.; and Dickson, Robert E., 3,814,705.
Dielman, Harold J., to Sanymetil Products Co., Inc., The. Toilet compartment for physically handicapped. 3,813,836, Cl. 52-239.000.
Diemond, Joseph; and Greenberg, Leonard E., to Coleco Industries, Inc. Pool with twirling seewaw. 3,813,702, Cl. 4-172.000.
Digital Equipment Corporation: *See—*
Cohen, John B.; Janson, Paul E.; and McFarland, Harold L., Jr., 3,815,099.
Dillard, John W.; Tringali, Dominick; and Swartz, Richard L., to Universal Business Machines, Incorporated. Automatic article sorting machine. 3,814,242, Cl. 209-111.700.
Dimeff, John: *See—*
Parker, John A.; Dimeff, John; and Heimbuch, Alvin H., 3,814,939.
Dimensional Development Corporation: *See—*
Nims, Jerry Curtis; and Lo, Allen Kwok Wah, 3,814,513.
Dirks Electronic Corporation: *See—*
Dirks, Gerhard; and Schenck, Paul F., 3,815,083.
Dirks, Gerhard; and Schenck, Paul F., to Dirks Electronic Corporation. Method and arrangement for sorting record units having keyfield bits arranged in descending order of significance without comparator. 3,815,083, Cl. 340-172.500.
Dishington, Roland H.: *See—*
Hook, William R.; Dishington, Roland H.; and Hilberg, Ronald P., 3,815,044.
Dmysh, Anthony. Nose-mounted catalytic cargo trailer and truck body heaters. 3,814,315, Cl. 237-31.000.
Dobbert, Gerd, to International Standard Electric Corporation. Horizontal deflection circuit for television receivers. 3,814,978, Cl. 315-27.0td.
Dobson, Donald Rhea: *See—*
Davis, James Howard; and Dobson, Donald Rhea, 3,815,014.
Dodge, David S.: *See—*
Cronin, John C.; and Dodge, David S., 3,814,830.
Doering, C., & Son, Inc.: *See—*
Doering, Henry H., Jr., 3,813,846.
Doering, Henry H., Jr., to Doering, C., & Son, Inc. Method and apparatus for sealing thermoplastic covers to trays. 3,813,846, Cl. 53-39.000.
Dolezal, Richard Joseph, to Sulzer Brothers Ltd. Steam power plant for a marine vessel. 3,813,876, Cl. 60-716.000.
Doman, Harvey A.: *See—*
McClain, Stephen A.; Doman, Harvey A.; and Entus, Richard D., 3,813,837.
Donald, Dennis Scott, to Du Pont de Nemours, E. I., and Company. Diamino substituted dicyan pyrazines and process. 3,814,757, Cl. 260-250.00r.
Dorosz, Adolph S.; Schaefer, Hans F., Jr.; and Sprague, Gordon V., Jr., to USM Corporation. Sewing machine with reciprocating work support means. 3,814,038, Cl. 112-121.150.
Dostourian, Harry: *See—*
Schauweker, George H.; and Dostourian, Harry, 3,813,734.
Dougherty, John S., to Allied Products Corporation. Window frame structure. 3,813,833, Cl. 52-214.000.
Douglas, James R.; Adams, Lloyd M.; Mycek, Edward G.; and Grafton, David A., to Xerox Corporation. Microform projection and viewer apparatus. 3,814,514, Cl. 353-78.000.
Douglas-Rownson Limited: *See—*
DeCourcy, Rowland J. J., 3,814,233.
Dow Chemical Company, The: *See—*
Clark, Harry L.; Trombley, Bertrand N.; and Eicholtz, Clara V., 3,814,489.
Fujioka, George S., 3,814,813.
Goldenberg, Harry, 3,814,669.
Downing, Frank O.: *See—*
Wilson, William L., 3,814,190.
Doyle, Edward J.; and Bartram, Nial C., to Schick Incorporated. Portable hooded hair moisturizer and dryer. 3,814,111, Cl. 132-9.000.
Dr. Carl Hahn GmbH: *See—*
Simon, Stefan, 3,814,469.
Drabek, Josef: *See—*
Martin, Henry; and Drabek, Josef, 3,814,798.
Draber, Wilfried; Timmler, Helmut; Buchel, Karl Heinz; and , to Fabenfabriken Bayer AG. N-substituted imidazoles as antimycotic agents. 3,814,802, Cl. 424-273.000.
Dragan, William B. Dental clutch former. 3,813,780, Cl. 32-19.000.
Drake, Oldrich: *See—*
Reese, Lewis E., 3,814,354.
Dso Izot: *See—*
Stanchev, Ivan Tenev; Popov, Anton Dimitrov; and Varbanov, Ivan Varbanov, 3,814,010.
Du Pont de Nemours, E. I., and Comapny: *See—*
Nebe, William John, 3,814,607.
Du Pont de Nemours, E. I., and Company: *See—*
Akers, Charles Amos, II; and Crewe, Stanley Carleton, 3,814,559.
Barkley, John R., 3,814,502.
Bostic, Carlton Ray; and Davis, John Maxwell, 3,814,728.
Boswell, George Albert, Jr., 3,814,751.
Cochran, Stanley Robert, 3,813,864.
Dickson, Frederick Stoever, III; and Williams, Warren Lee, 3,814,341.
Donald, Dennis Scott, 3,814,757.
Hertler, Walter R., 3,814,604.
Martinez, Boni Philip; and Pruckmayr, Gerfried, 3,814,623.
Pruckmayr, Gerfried, 3,814,580.
Ducommun, Georges: *See—*
Adler, Karl; and Ducommun, Georges, 3,814,510.
Duer, Morris J., to General Motors Corporation. Shaft and arm assembly. 3,814,528, Cl. 403-256.000.
Dugan, Danial E. Control apparatus for sound reinforcement systems. 3,814,856, Cl. 179-1.0at.
Dumas, Guy, to Societe Anonyme Silec-Semi-Conducteurs. Method for the simultaneous difussion of impurities in silicon and semiconductor devices resulting from it. 3,814,639, Cl. 148-187.000.
Dumbaugh, William H., Jr. Beryllium-containing high elastic modulus glasses. 3,814,611, Cl. 106-52.000.
Dunavant, Milton L. Cement handling container. 3,814,149, Cl. 141-231.000.
Duncan, David Gray, to Imperial Chemical Industries Limited. Polish compositions. 3,814,710, Cl. 260-28.000.
Dunlop Holdings Limited: *See—*
Powell, Leslie Vernon; and Edwards, Reginald Harold, 3,814,161.
Dunn, Alvie R.: *See—*
Zeunen, Barthel; Grace, Rex C.; and Dunn, Alvie R., 3,814,519.
Dupre, Paul: *See—*
Aries, Robert; Dechaumet, Armand; and Dupre, Paul, 3,814,061.
Durkoppwerke G.m.b.H.: *See—*
Nicolay, Karl, 3,814,037.
Duro-Test Corporation: *See—*
Thouret, Wolfgang E.; and Kaufman, Rudolph, 3,814,973.
Dyer, Robert E.: *See—*
Finlay, Alexander, Jr.; Dyer, Robert E.; and Kessler, William D., 3,815,119.
Dykehouse, Roger D.: *See—*
Maskell, John S.; and Dykehouse, Roger D., 3,813,755.
Dynachem (societe a responsibilite limitee): *See—*
Aries, Robert; Dechaumet, Armand; and Dupre, Paul, 3,814,061.
Eastex Packaging, Inc.: *See—*
Hester, William A., 3,814,304.
Eastman Kodak Company: *See—*
Contois, Lawrence E., 3,814,600.
Cree, David A., 3,814,599.
Gallois, Daniel J., 3,814,605.
Verdone, Joseph A.; and Kebles, Michael K., 3,814,696.
Eaton Corporation: *See—*
Kirk, Robert T., 3,815,091.
Pease, Logan L., 3,815,084.
Eaton Medical Electronics, Inc.: *See—*
Eaton, Thomas E., 3,814,249.
Eaton, Thomas E., to Eaton Medical Electronics, Inc. Dialysis apparatus. 3,814,249, Cl. 210-86.000.
Ebenbichler, Hubert, to Swarovski, D., & Co. Light reflector construction for deterring game for crossing highways. 3,814,500, Cl. 350-97.000.
Eberhardt, Edward H., to International Telephone and Telegraph Corporation. Smoothing optical cathode ray tube. 3,814,979, Cl. 315-11.000.
Ebersole, D. Henry, to Koehring Company. Apparauts for producing variable amplitude vibratory force. 3,813,950, Cl. 74-61.000.
Eckels, Robert E. Vehicle passenger crash protector. 3,814,459, Cl. 280-150.00b.
Eckfeldt, John H., to Rohm and Haas Company. Stabilized pesticidal compositions containing alkyl dinitrophenyl esters. 3,814,803, Cl. 424-286.000.
Ecodyne Corporation: *See—*
McGovern, Frank J., 3,814,256.
Weis, Frank G., 3,814,551.
Ecolonet, Inc.: *See—*
Gower, William, 3,814,150.
Ecolotec Inc.: *See—*
Larkin, Robert F., 3,814,204.

Eddy, John W., to GTE Automatic Electric Laboratories Incorporated. Matrix-protecting supervisory arrangement for a communication switching system. 3,814,862, Cl. 179-18.0ge.

Edelmann, E., & Co.: *See*—
Wallskog, Alan G., 3,813,904.

Eder, Josef; and Meierhofer, Karl, to Erma-Werke Waffen- und Maschinenfabrik GmbH. Locking means for bolt type firearms. 3,813,803, Cl. 42-16.000.

Eder, Theodor, to Aspanger Kaolin- und Steinwerke Aktiengesellschaft. Process and apparatus for the least partly removing by gravity a particulate component from a liquid dispension. 3,813,851, Cl. 55-52.000.

Edington, John Edward; and Warnock, Merville Lee, to Bell Telephone Laboratories, Incorporated. Coin operated telephone set employing electronic totalizer. 3,814,907, Cl. 235-92.0cn.

Edwards, Philip K., to Datavision, Inc. Method of synchronizing televicion compatible signal generating equipment to composite synchronization signals. 3,814,854, Cl. 178-69.50n.

Edwards, Reginald Harold: *See*—
Powell, Leslie Vernon; and Edwards, Reginald Harold, 3,814,161.

Egli, Emil: *See*—
Goldammer, Georg; Grimm, Eberhard; and Egli, Emil, 3,813,866.

Ehlers, Peter L.: *See*—
Dahl, H. Douglas; Davis, J. Gilbert, II; and Ehlers, Peter L., 3,814,480.

Eicholtz, Clara V.: *See*—
Clark, Harry L.; Trombley, Bertrand N.; and Eicholtz, Clara V., 3,814,489.

Eickhof, John K. Hydraulically elevated birdhouse construction. 3,814,059, Cl. 119-23.000.

Eilerman, George E.: *See*—
McWilliams, Donald E.; Killmeyer, Charles W.; and Eilerman, George E., 3,814,592.

Eilers, Kenneth I.: *See*—
Toy, Arthur D. F.; and Eilers, Kenneth I., 3,814,610.

Eldorado Tool & Manufacturing Corporation: *See*—
Bloch, Eric F., 3,813,827.

Elecktroteile GmbH: *See*—
Veh, Herbert, 3,814,133.

Electro Print, Inc.: *See*—
Iisch, Thomas A.; and Jenkins, Thomas A., 3,815,145.

Electroglas, Inc.: *See*—
Fredriksen, Thorbjoern R., 3,814,895.

Electronic Associates of Canada Ltd.: *See*—
Wiles, Sydney T., 3,815,019.

Elektro-Thermit GmbH: *See*—
Arndt, Gerhard, 3,813,760.

Elkem-Spigerverket A.S.: *See*—
Steineke, Fredrik, 3,813,852.

Ellin, Nils A. Tie form construction. 3,813,694, Cl. 2-153.000.

Elliott, George E., Jr.: *See*—
Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., 3,814,682.
Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., 3,814,684.

Elliott, Kenneth Frederick: *See*—
Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, 3,814,990.

Ellis Corporation: *See*—
Toth, Alex, 3,813,903.

Ellis, William D.; and Mulvaney, Bruce D., to Honeywell Inc. Blood platelet separation. 3,814,687, Cl. 210-49.000.

Eloy, Fernan G. F.; and Goldberg, Morton E., to Mallinckrodt Chemical Works. 10-Acetamide-S-triazolo-(,4-a)-isoquinolines. 3,814,711, Cl. 260-287.00r.

Emerson Electric Co.: *See*—
Burket, Richard A.; Fleer, Thomas P.; Smith, Carl A.; and Love, John J., 3,814,634.

Encke, Jesse I. Exercise device. 3,814,420, Cl. 272-83.00r.

Englehard Minerals & Chemicals Corporation: *See*—
Highberg, Carle W.; and Roesch, George R., 3,813,820.

English Electric Company Limited: *See*—
Heap, Harry Rodney; and Riley, Colin Charles, 3,813,759.

Enic, Ronald B.: *See*—
United States of America, National Aeronautics and Space Administration, 3,814,645.

Enstrom, Ronald Edward; and Fisher, Dennis Glendon, to United States of America, Air Force. Photocathodes. 3,814,996, Cl. 357-30.000.

Entus, Richard D.: *See*—
McClain, Stephen A.; Doman, Harvey A.; and Entus, Richard D., 3,813,837.

Environment/One Corporation: *See*—
Rich, Theodore A., 3,813,991.

Envirotech Corporation: *See*—
Di Gregorio, David; and Shell, Gerald Lynwood, 3,814,396.

Eriksson, Karl Erik Ingemar. Container handling machine. 3,814,232, Cl. 198-19.000.

Erlmeier, Robert; Hilberath, Freidrich; Meisenburg, Ewald; and Spengler, Gunter, to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft. Preparation of fuels for supersonic aircraft. 3,814,679, Cl. 208-15.000.

Erma-Werke Waffen- und Maschinenfabrik GmbH: *See*—
Eder, Josef; and Meierhofer, Karl, 3,813,803.

Esso Research and Engineering Company: *See*—
Bell, Richard W., 3,814,124.
Scher, Herbert I.; Ungar, Israel S.; and McQuade, John E., Jr., 3,814,647.
Song, Won R., 3,814,690.
Tornquist, Erik; and Langer, Arthur W., Jr., 3,814,743.

Etablissements J.J. Carnaud & Forges de Basseindre: *See*—
Rayzal, Jean Francois, 3,814,279.

Etat Francais: *See*—
Daniel, Andre Francis Albert, 3,814,018.

Etzcorn, Mary C. Portable stove hood. 3,814,078, Cl. 126-299.00c.

Eudman, David W.: *See*—
Friend, William H.; Natof, Stuart L.; Reiter, Eugene A.; and Eudman, David W., 3,813,999.

Evers and Wall Limited: *See*—
Skurray, Stephen J., 3,814,320.

Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., to Merck & Co., Inc. Process for curing dry and emmi-dry sausages. 3,813,817, Cl. 426-56.000.

Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., to Merck & Co., Inc. Process for curing dry and semi-dry sausages. 3,814,817, Cl. 426-56.000.

Everts, Robert G.: *See*—
Schramm, Buford J., 3,814,540.

EVG Entwicklungs- und Verwertungs Gesellschaft m.b.H.: *See*—
Gott, Hans; Ritter, Klaus; Ritter, Josef; and Ritter, Gerhard, 3,814,145.

Eweson, Eric W.; and Weeson, Anthony Frazer. Apparatus for making organic fertilizer. 3,814,588, Cl. 23-259.100.

Eymard, Pierre Luc Georges, to Laboratories J. Berthier S.A. Medicament and method of increasing the calcium content of the blood. 3,814,812, Cl. 424-318.000.

Ezaki Glico Kabushiki Kaisha, The: *See*—
Hashimoto, Juzo; Kawamoto, Hisashi; Kanbara, Isao; Inoue, Akira; and Kitajima, Akira, 3,814,815.

Fabenfabriken Bayer AG: *See*—
Draber, Wilfried; Timmler, Helmut; Buchel, Karl Heinz; and , 3,814,802.

Fahey, Dennis; and Cunningham-Smith, David, to Boulton, William, Limited. Vibro-gyratory mills. 3,814,335, Cl. 241-69.000.

Fairbanks, John R.: *See*—
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E., 3,814,356.

Fairchild, Willis A. Tobacco substitute. 3,814,108, Cl. 131-2.000.

Faltin, Hans G., to Advance Enterprises, Inc. Paper trimming knife system. 3,813,981, Cl. 83-500.000.

Fan, Hsing Y., to Shell Oil Company. Nematode control employing certain helo-α-Alkyl-benzyl alcohols. 3,814,807, Cl. 424-343.000 M7 12/30/70.

Fann, James D. Heat control apparatus. 3,814,902, Cl. 219-492.000.

Fannin, Wayne V.; and Schultze, Harold E., to General Motors Corporation. Energy dissipating unit. 3,814,219, Cl. 188-282.000.

Fanton, Ralph E., to Air Preheater Company, Inc., The. Stack lifting device. 3,814,036, Cl. 110-18.00r.

Farbenfabriken Bayer Aktiengesellschaft: *See*—
Fischer, Rolf; and Merten, Rudolf, 3,814,776.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Burning: *See*—
Feiler, Leander; and Korbanka, Helmut, 3,814,738.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; Meininger, Fritz; Mischke, Peter; and Schon, Franz, 3,814,579.

Farish, Owen: *See*—
Cookson, Alan H.; Farish, Owen; and Gauntz, John M., 3,814,879.

Fash, William G.: *See*—
Leach, Jack; Zoufaly, Jerome; and Fash, William G., 3,814,016.

Fastner, Thorwald: *See*—
Listhuber, Friedrich; Fastner, Thorwald; and Bachner, Ernst, 3,814,167.

Federal Pacific Electric Company: *See*—
De Torre, John, 3,815,070.

Federal-Huber Corporation: *See*—
Williams, Frank N., 3,813,706.

Fedrick, Nicolas W. Retractable extension cord unit. 3,815,078, Cl. 339-28.00r.

Feeman, James F., to Crompton & Knowles Corporation. Blue phenylazonapathylazo-N-arylperiacids. 3,814,749, Cl. 260-190.000.

Fehrenbacher, Wolfgang, to Kieninger & Obergfell, Fabrik fur technische Laufwerke und Apparate. Rotary stepping mechanism with cylinder lock arrangement. 3,813,952, Cl. 74-84.000.

Feiler, Leander; and Korbanka, Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Burning. Methylstyrene/styrene/isobutene terpolymer resins and process for their manufacture. 3,814,738, Cl. 260-80.780.

Felder, Winfried: *See*—
Podssuweit, Klaus; and Felder, Winfried, 3,814,224.

Felt Products Mfg. Co.: *See*—
Neff, Clarence H., 3,814,530.

Fenske, Ellsworth R.; and McLaughlin, James H., to Universal Oil Products Company. Determination of the temperature required for a predetermined volatility ratio. 3,813,925, Cl. 73-64.200.

Ferag AG: *See*—
Balass, Valentin, 3,814,213.

Ferlux: *See—*
Philippe, Jean B., 3,814,772.
Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roay. Soap composition and process of producing such. 3,814,698, Cl. 252-370.000.
Fettel, Bruce E.; and Burd, Samuel, to Shiley Laboratories, Inc. Binasal pharyngeal airway. 3,814,103, Cl. 128-351.000.
Fiaschi, Gastone, to Lukas-Beddy S.p.A. Bed-settee. 3,813,711, Cl. 5-24.000.
Fiat Societa per Azioni: *See—*
Palazzetti, Mario; Cavallarin, Bruno; and Villa, Giovanni, 3,815,069.
Vanti, Lamberto, 3,814,134.
Fiberfuge Company: *See—*
Wilson, Peter C.; and Hughart, Robert P., 3,814,246.
Fields, Harold T.; and Habegger, Richard J., to General Electric Company. Apparatus for tying coils. 3,813,754, Cl. 29-203.00d.
Filter Specialists, Inc.: *See—*
Morgan, Howard William, Jr., 3,814,261.
Fink, William Lloyd, to Todd-Shipyards Corporation. Apparatus and means for monitoring moments in material handling equipment. 3,815,116, Cl. 340-267.00c.
Finlay, Alexander, Jr.; Dyer, Robert E.; and Kessler, William D., to Sangamo Electric Company. Remote meter reading system using electric power lines. 3,815,119, Cl. 340-310.00r.
Firestone Tire & Rubber Company, The: *See—*
Ryder, John Charles, 3,814,158.
Fischer & Porter Co.: *See—*
Head, Victor P., 3,813,939.
Fischer & Porter Company: *See—*
Grosch, Hermann; and Oelbe, Hans-Werner, 3,813,938.
Fischer, Gerhard; and Strucker, Gunter, to Gustav Schade Maschinenfabrik and Bulk Material scraper. . 3,814,268, Cl. 214-10.000.
Fischer, Robert K.: *See—*
Helms, James K.; and Fischer, Robert K., 3,814,893.
Fischer, Rolf; and Merten, Rudolf, to Farbenfabriken Bayer Aktiengesellschaft. Hydantoins and polyhydantoins containing olefin groups. 3,814,776, Cl. 260-309.500.
Fish, John G.: *See—*
Reinberg, Alan R.; and Fish, John G., 3,814,641.
Fisher, Dennis Glendon: *See—*
Enstrom, Ronald Edward; and Fisher, Dennis Glendon, 3,814,996.
Fishman, Jack, Lewenstein, Evalina; executrix of the estate of Lewenstein, Mozes J.; deceased. 6-Methylene-6-desoxy dihydro morphine and codeine derivatives and pharmaceutically acceptable salts. 3,814,768, Cl. 260-285.000.
Fitzgerald, Clendon Hart: *See—*
Weiss, Lowell Warner; and Fitzgerald, Clendon Hart, 3,813,933.
Fitzgerald, Robert E. Meat cleaner and conditioner. 3,813,775, Cl. 30-279.00r.
Fleer, Thomas P.: *See—*
Burket, Richard A.; Fleer, Thomas P.; Smith, Carl A.; and Love, John J., 3,814,634.
Fletcher, James C.; and Johnston, William V. Heat flow calorimeter. 3,813,937, Cl. 73-190.00r.
Flohr, Ira Karl. Safety cable and band. 3,813,733, Cl. 24-81.00a.
Flubacker, Charles H. Actuator for vending machine. 3,814,284, Cl. 221-301.000.
Fluid displacement apparatus having helical displacement elements: *See—*
Volz, Hermann, 3,814,557.
Fluid Energy Processing & Equipment Company: *See—*
Stephanoff, Nicholas N., 3,814,316.
Flying spot film scanner providing increased time for film full-down: *See—*
Matchell, Raymond, 3,814,850.
FMC Corporation: *See—*
Browning, Jhonce Nelson, 3,814,701.
Lotto, Ronald L., 3,813,998.
Peter, Alfred O., 3,814,024.
Foley, Charles Frederick. Rotational energy absorbing target and projectile. 3,814,428, Cl. 273-95.00r.
Ford Motor Company: *See—*
Boyd, William D.; Dale, Dennis L. E.; and Jones, Roy, 3,814,392.
Maker, David L.; Peng, Stephen C.; and Vos, Arend W. D., 3,814,720.
Maker, David L., 3,814,721.
Windett, Robert Michael; and Martin, Anthony John, 3,813,960.
Forgione, Albert Gerard. Bruxism monitoring device. 3,813,781, Cl. 32-19.000.
Formica, Santo J.: *See—*
McGinley, Patrick; and Formica, Santo J., 3,814,239.
Forrer, Homer W., to Mead Corporation, The. Article carrier. 3,814,237, Cl. 206-167.000.
Forsberg, K. Holger. Liquid control apparatus for chromatography columns. 3,814,253, Cl. 210-97.000.
Foster, Alan, to U.S. Philips Corporation. Semiconductor devices. 3,813,761, Cl. 29-583.000.
Foster Wheeler Corporation: *See—*
Bow, William J., 3,814,398.
Fowell, Andrew J., to American Standard Inc. Lavatory mounting structure. 3,813,707, Cl. 4-187.00a.
Fowler, Timothy J., to Monsanto Company. Plastic pallets. 3,814,031, Cl. 108-51.000.
Fox, Joseph N.: *See—*
Davis, Charles M., Jr.; and Fox, Joseph N., 3,814,009.
Fradeneck, Ronald J., to Bethlehem Steel Corporation. Apparatus for inserting an expendable sensor into a basic oxygen furnace. 3,813,943, Cl. 73-343.00r.
Francis, Jonathan. Lightweight, compact air mattress. 3,813,716, Cl. 5-348.000.
Franklin, Benjamin S.: *See—*
Nibby, Chester M.; Manton, John C.; Franklin, Benjamin S.; and Curley, John L., 3,814,922.
Franklin Electric Co., Inc.: *See—*
Woods, Richard E.; and Hohman, William H., 3,815,006.
Franklin Manufacturing Company: *See—*
Kackley, William Gene, 3,814,491.
Frasca, Ann C. Lighted earring. 3,814,926, Cl. 240-6.40n.
Fraser, James H.: *See—*
Johnson, Wallace E.; and Fraser, James H., 3,813,892.
Fraser, Joseph Wilfred, Jr.; Lam, Charles T. W.; and Mast, Raymond L., to Miler Laboratories, Inc. Composition, method and device for determining bilirubin and urobilinogen. 3,814,586, Cl. 23-230.00b.
Frazeir, Dean R.: *See—*
Olson, Robert L.; and Frazeir, Dean R., 3,814,748.
Freade, Ronald; and Haden, Billy Harper, to Miles Laboratories, Inc. Test article for use in microbiology. 3,814,670, Cl. 195-127.000.
Frederickson, Robert Eugene; and Hammond, Joseph, to McCulloch Corporation. Vibration isolation system particularly adapted for use with a chain saw. 3,813,776, Cl. 30-381.000.
Fredriksen, Thorbjoern R., to Electroglas, Inc. Laser scriber control system. 3,814,895, Cl. 219-121.00l.
Free, John Marshall, to Hoffmann-La Roche Inc. Object recognition. 3,814,521, Cl. 356-156.000.
Freed, Marvin J. Wall mounted sheet holder. 3,814,368, Cl. 248-316.00r.
Freedman, Norman S.; Horsting, Carle W.; Lawrence, Walter F.; and Carrona, John J., to Radio Corporation of America. Thermo-electric modular structure and method of making same. 3,814,633, Cl. 136-205.000.
Freeman, Michael Horold, to Pilkington P.E. Limited. Optical systems. 3,814,508, Cl. 350-299.000.
French Oil Mill Machinery Company, The: *See—*
Slaby, Robert K.; and Bredeson, Dean K., 3,814,563.
Frey, Irwin K.; and Zola, Charles L. Food warming system with supporting rack structure and food warming appliances. 3,814,900, Cl. 219-385.000.
Friberg, John Inge Ronnie; and Fritjofsson, Sture Fingal Esaias, to N.V. Veluwse Machine Industrie. Apparatus for cutting of steel cord for tires. 3,813,974, Cl. 83-155.000.
Frick, Egon, to Orenstein & Koppel AG. Double slewing crane construction. 3,814,264, Cl. 212-3.000.
Fried, Morton: *See—*
Simpson, Eric, Jr.; and Fried, Morton, 3,813,839.
Friedman, David S. Sofa-bed. 3,813,709, Cl. 5-12.000.
Friedman, Jerome D. Electrical circuit for providing automatic alternate switching. 3,814,947, Cl. 307-41.000.
Friend, William H.; Natof, Stuart L.; Reiter, Eugene A.; and Eudman, David W., to Union Camp Corporation. Apparatus for combining partition and box blank. 3,813,999, Cl. 93-37.00r.
Fritjofsson, Sture Fingal Esaias: *See—*
Friberg, John Inge Ronnie; and Fritjofsson, Sture Fingal Esaias, 3,813,974.
Frotiee, Jacques. Apparatus capable of being submerged principally for fishing. 3,813,809, Cl. 43-43.130.
Fuehrer, Reece R., to General Motors Corporation. Transmission with retarder and control and lubrication system. 3,814,221, Cl. 192-3.340.
Fuji Kuuki Kabushiki Kaisha: *See—*
Inoue, Katashi, 3,814,209.
Fuji Photo Film Co.: *See—*
Fujiwara, Kiyoharu, 3,814,342.
Fuji Photo Film Co., Ltd.: *See—*
Kasugai, Tsuneo; Minagawa, Nobuhiko; and Sato, Masamichi, 3,814,617.
Kitamoto, Tasuji; Aonuma, Masashi; and Kawaziri, Kazuhiro, 3,814,672.
Mukaida, Yoshito; Kubotera, Kikuo; and Mizuki, Eiiche, 3,814,603.
Ozawa, Mitsuo; and Ogawa, Yasuhisa, 3,814,606.
Shiba, Keisuke; and Sato, Akira, 3,814,609.
Shinozaki, Fumiaki; Ikeda, Tomoaki; Makaida, Yoshito; and Tsuboi, Masayoshi, 3,814,602.
Fujikura Cable Works Limited, The: *See—*
Isshiki, Setsuya; Nakayama, Shiro; and Nakayama, Kuniyuki, 3,814,622.
Fujimoto, Norihiro: *See—*
Hayashi, Kunihisa; and Fujimoto, Norihiro, 3,813,818.
Fujio, Fumio, to Nippon Cable Systems Inc. Automatic control cable assembly. 3,815,061, Cl. 335-145.000.
Fujioka, George S., to Dow Chemical Company, The. Preparation of sodium aluminum hydride. 3,814,813, Cl. 423-644.000.
Fujisawa, Kiyoji; and Tomita, Masao, to Matsushita Electric Industrial Co., Ltd. Automatic noise reduction system. 3,815,039, Cl. 330-51.000.
Fujishima, Hiroyasu: *See—*
Hashida, Taizo; Okumura, Masaru; and Fujishima, Hiroyasu, 3,814,162.
Fujitsu Limited: *See—*

Inoue, Kozo; Hara, Toshito; Kitazawa, Takeo; Yamamoto, Kazuyoshi; and Oguma, Toshiro, 3,814,612.
Sasaki, Hajime; Yamagishi, Kazuo; Sakai, Sukeyoshi; and Hoshi, Toshihiro, 3,813,767.

Fujiwara, Kiyoharu, to Fuji Photo Film Co. Automatic web taking-up device. 3,814,342, Cl. 242-56.00a.

Fukayama, Gary P., to Motorola, Inc. Capstan drive assembly for a cartridge tape player. 3,814,300, Cl. 226-194.000.

Fukuda, Takeji: *See—*
Tanaka, Eihachiro; Onodera, Yutaka; Fukuda, Takeji; Yamashita, Tsutomu; and Kuma, Shoji, 3,813,764.

Fukui, Hiroshi; Iwatsu, Gakuji; and Kato, Junichi, to Aichi Steel Works, Limited. Leaf spring construction. 3,814,410, Cl. 267-47.000.

Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Automatically locking slider for zip fastener. 3,813,736, Cl. 24-205.14r.

Fukuura, Yokio: *See—*
Honda, Toshio; Kobota, Eishi; Tanaka, Shoji; and Fukuura, Yokio, 3,814,713.

Fuller, Harry S.; and Partch, Ambrose H., to Love, J. E., Company. Cutterbar improvements in a harvesting machine. 3,813,859, Cl. 56-260.000.

Fulmer Research Institute Limited: *See—*
Lewin, Ronald Harvey; and Hayman, Cecil, 3,814,625.

Funk, Chris. Polishing apparatus. 3,813,816, Cl. 51-7.000.

Funk, Friedrich G. Colloid mill. 3,814,334, Cl. 241-70.000.

Furgason, Leon M. Moisture transducer. 3,813,927, Cl. 73-73.000.

Furukowa Electric Company Limited: *See—*
Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, 3,814,778.

Gabriel, James M.; and Reilly, William, to Chromally American Corporation. Wear resistant powder metal magnetic pole piece made from oxide coated Fe-Al-Si powders. 3,814,598, Cl. 75-206.000.

Gabron, Frank; and McCullough, John E., to Little, Arthur D., Inc. Dual-mode cryogenic support system. 3,814,361, Cl. 248-146.000.

Gall, John S.; and Halek, George W., to Celanese Corporation. Process for making polybutylene terephthalate blow molded article. 3,814,786, Cl. 264-98.000.

Gallois, Daniel J., to Pouillot, Bernard and Eastman Kodak Company. Photographic elements and their preparation. 3,814,605, Cl. 96-58.000.

Ganderton, David; McAinsh, James; and Varney, Gordon, to Imperial Chemical Industries Limited. Dressing. 3,814,097, Cl. 128-268.000.

Garbalizer Corporation of America: *See—*
Brewer, John C., 3,814,336.

Gardner, Thomas E.; and Popovici, Mihail C., to Memorex Corporation. Disc drive diagnostic display apparatus. 3,815,097, Cl. 340-172.500.

Gardner, Willis W., to Waukesha Bearings Corporation. Thrust bearing with pad-retaining and lubrication means. 3,814,487, Cl. 308-160.000.

Gargaro, Michael. Bracket for paint cans. 3,814,364, Cl. 248-210.000.

Garrett, Paul A. Boring bar. 3,814,536, Cl. 408-157.000.

Gast, Theodor; Twisselmann, Lorenz; and Marx, Wolf-Rudiger, to Hartmann & Braun Aktiengesellschaft. Magnetic gas analyzer using a gas chamber for improved gas flow with magnets external to said chamber. 3,815,018, Cl. 324-36.000.

Gates Rubber Company, The: *See—*
Larkin, Terrance M., 3,814,628.

Gaudio, Anna: *See—*
Gaudio, Domenico, 3,813,721.

Gaudio, Domenico, 1/4 interest each to Gaudio, Anna, Gaudio, Thelma, Gaudio, Vincent and Schultz, Nina. Water hose, rotary brush attachment. 3,813,721, Cl. 15-29.000.

Gaudio, Thelma: *See—*
Gaudio, Domenico, 3,813,721.

Gaudio, Vincent: *See—*
Gaudio, Domenico, 3,813,721.

Gaumer, Lee S.: *See—*
Allam, Rodney John; Bligh, Bernard Ramsey; and Gaumer, Lee S., 3,813,889.

Gauntz, John M.: *See—*
Cookson, Alan H.; Farish, Owen; and Gauntz, John M., 3,814,879.

Gazda, Irving William, to Great Lakes Carbon Corporation. Nipple-electrode assembly. 3,814,828, Cl. 13-18.000.

Gebruder Linck: *See—*
Reuter, Alfred, 3,814,155.

Geist, Jacob M.; Paul, Roy A.; and Thorogood, Robert M., to Air Products and Chemicals, Inc. Contacting column. 3,814,397, Cl. 261-114.00r.

Gelb, Leonard L.: *See—*
United States of America, National Aeronautics and Space Administration, 3,814,645.

Gemender, John F.; and Schwenker, Eric H., to Addison Products Company. Refrigeration system charging kit. 3,813,893, Cl. 62-129.000.

General Cable Corporation: *See—*
Johnson, James C., 3,814,348.

General Electric Company: *See—*
Adams, Glen O., 3,814,550.
Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., 3,814,620.
Bean, Charles P.; and De Blois, Ralph W., 3,815,024.
Bhattacharya, Ashok K., 3,814,971.
Bower, Arnold B., Jr.; and Leighton, Joseph C., 3,814,482.
Bowers, David L.; Heidtmann, Donald S.; and Harnden, John D., Jr., 3,814,888.
Brezosky, Bernard J., 3,814,363.
Church, Ralph E., 3,813,763.
Cook, Newell C., 3,814,673.
Coppola, Patrick S.; Sunderland, Luther D.; and Wildrick, Milton I., 3,813,990.
Dada, Abdul G., 3,814,327.
Fields, Harold T.; and Habegger, Richard J., 3,813,754.
Ghaem-Maghami, Sanjar; and Surowiec, Edward P., 3,814,842.
Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., 3,814,722.
Golibersuch, David C., 3,815,022.
Gordon, Walter H., Jr.; and Ryckman, William D., Jr., 3,814,899.
Guth, Lauren W., 3,813,942.
Hatch, Burton D., 3,813,898.
Hewitt, Terry L., 3,814,909.
Karstedt, Bruce D., 3,814,730.
Klompas, Nicholas, 3,814,539.
McCardle, Arthur, Jr.; Sponseller, Robert Lee; and Gross, Charles Henry, 3,814,325.
Miglore, C. Michael, 3,813,908.
Milkovic, Miran, 3,815,011.
Milkovic, Miran, 3,815,012.
Milkovic, Miran, 3,815,013.
Sapienza, James J., 3,814,333.
Simoneau, Edward T.; Moeller, Ricahrd E.; and Holdstock, Norman G., 3,814,706.
Skogland, Thorbjorn, 3,813,771.
Sofianek, Joseph C., 3,814,885.
Swin, William A.; and Reising, Flavian, Jr., 3,815,015.
Wanger, Robert Pierce, 3,814,324.
Welch, Stanley B., 3,815,113.
Wolfe, John E.; Ledges, George E.; and Glascock, Homer H., 3,814,975.

General Instrument Corporation, mesne: *See—*
McGrath, Ronald P.; and Bleher, William A., 3,815,108.

General Motors Company: *See—*
Stoltman, Donald D., 3,814,537.

General Motors Corporation: *See—*
Beam, Paul E., Jr.; Hunt, Albert L., Jr.; and Spears, Esten W., Jr., 3,814,313.
Buchwald, Robert M., 3,814,071.
Casey, James M., 3,814,555.
Duer, Morris J., 3,814,528.
Fannin, Wayne V.; and Schultze, Harold E., 3,814,219.
Fuehrer, Reece R., 3,814,221.
Hill, Robert T., 3,814,001.
Hug, Karl, 3,813,961.
Jacobs, James W., 3,814,492.
Koivunen, Erkki A., 3,814,222.
Martin, James R., 3,814,225.
Robbins, Samuel B., 3,814,861.
Ryntz, Edward F., Jr.; Janowak, John F.; and Watton, John F., 3,813,944.
Wagner, Ronald M., 3,814,994.
White, Charles R., 3,814,226.

General Signal Corporation: *See—*
Kormos, Kalman; and Szilagyi, Dezso, 3,814,380.
Matthews, William J.; and Macano, Samuel J.., 3,814,484.
Samuelian, Maurice P., Sr.; and Rideout, Gerald E., 3,814,360.

General Tire & Rubber Company, The: *See—*
Britton, James E.; Welch, John A.; and Hein, Richard D., 3,814,412.

Gerhard, Helmut, to Westerwalder Eisenwerk Gerhard KG. Freight containers for flowable goods. 3,814,290, Cl. 222-143.000.

Gerhauser, Merton F.; and Young, Emil O.; deceased (by Young, Gladys R.; Executrix), to Young Regulator Company. Temperature control device. 3,814,312, Cl. 236-49.000.

Germanchuk, Vyacheslav Nikolaevich: *See—*
Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Germanchuk, Vyacheslav Nikolaevich, 3,814,829.

Gfa-Antriebstechnik Gesellschaft mit beschrankter Haftung: *See—*
Meyer, Hans, 3,813,958.

Ghaem-Maghami, Sanjar; and Surowiec, Edward P., to General Electric Company. RGB amplifier. 3,814,842, Cl. 178-5.4ma.

Gibier-Rambaud, Alain; and Blanc, Bernard. Polyurethane prepolymers having improved stability and method for their preparation. 3,814,736, Cl. 260-77.5ac.

Gideco: *See—*
Giraud, Abel, 3,814,006.

Gieszl, Carl R. Steering system. 3,814,203, Cl. 180-79.20r.

Gilbert & Barker Manufacturing Company: *See—*
Mesh, Theodore Julius; and Devine, George Thomas, 3,814,934.

Gilbert and Barker Manufacturing Company: *See—*
Mesh, Theodore, 3,814,146.

Gilbert, Paul, to Lever Brothers Company. Weight quality control determination. 3,814,195, Cl. 177-1.000.

Gilbert, Ronald E.; Jones, Joseph W., Jr.; and Henry, Raymond M., to Gulf Research & Development Company. Ethylene-acrylic acid polymers having improved optical characteristics. 3,814,737, Cl. 260-80.730.

Giliberty, Richard P. Prosthetic hip joint. 3,813,699, Cl. 3-1.000.

Gilleland, Randall C.: *See—*

Bell, Oliver A., Jr.; and Gilleland, Randall C., 3,814,894.

Gillespie, Sidney L., to Woodward Governor Company. Manifold pressure controller fuel limiter. 3,814,072, Cl. 123-179.001.

Gillet, Roger: *See—*
Lehuen, Christian; and Gillet, Roger, 3,814,959.

Gillette Company, The: *See—*
Lotfallah, Lotfi H., 3,814,526.

Gillig, Frederick S.; Smolka, Frank R.; and Trembly, Lynn D., to Marathon Oil Company. Graphic determination of interval velocity. 3,813,784, Cl. 33-1.0hh.

Gilmartin, Earl J., Jr.; Allen, Alfred E., Jr.; and Meeder, Donald R. Process of producing a chunked cheese flavored product. 3,814,825, Cl. 426-361.000.

Gilson Bros. Co.: *See—*
Price, Warren H.; and Hochwitz, Lynn E., 3,813,954.

Giraud, Abel, to Gideco. Machine for manufacturing pancakes and other similar products. 3,814,006, Cl. 99-423.000.

Girden, Barney B. Rebound board for table handball. 3,814,422, Cl. 273-30.000.

Girling Limited: *See—*
Lawson, Thomas Gordon, 3,814,121.
Robinson, Barry Samuel John, 3,814,485.

Giroux, Richard L., to Halliburton Company. Oil well testing apparatus. 3,814,182, Cl. 166-226.000.

GKN Birwelco Limited: *See—*
Harris, Peter John; Holmes, Barry Stanford; and Ryder, John Lee, 3,814,177.

Glader, James. Electrical outlet box. 3,814,834, Cl. 174-57.000.

Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., to General Electric Company. Heat curable polysiloxane compositions containing fibers. 3,814,722, Cl. 160-37.0sb.

Glascock, Homer H.: *See—*
Wolfe, John E.; Ledges, George E.; and Glascock, Homer H., 3,814,975.

Glass, Marvin, & Associates: *See—*
Barlow, Gordon A.; and Kramer, Norman, 3,813,812.

Glaze, John W., Jr., to Intech Corporation. Hosiery package. 3,814,235, Cl. 206-45.140.

Goff, Richard E., Jr.: *See—*
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Priestley, Joseph A., 3,813,698.

Goforth, David L. Fishhook. 3,813,808, Cl. 43-43.200.

Goldammer, Georg; Grimm, Eberhard; and Egli, Emil, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Gripping means for doffing yarn packages. 3,813,866, Cl. 357-52.000.

Goldberg, Morton E.: *See—*
Eloy, Fernan G. F.; and Goldberg, Morton E., 3,814,711.

Golden, Donald P.: *See—*
United States of America, National Aeronautics and Space Administration, 3,814,083.

Goldenberg, Harry, to Dow Chemical Company, The. Determination of glutamic-oxalacetic transaminase. 3,814,669, Cl. 195-103.50r.

Goldfarb, Adolph E.; and Benkoe, Erwin. Incremental racing game. 3,814,424, Cl. 273-86.00g.

Goldman, Arnold J., to Lexitron Corporation. Information processing system. 3,815,104, Cl. 340-172.500.

Goldman, Samuel C.: *See—*
Martone, Ronald J.; Goldman, Samuel C.; and Wolczek, Walter, 3,814,938.

Golibersuch, David C., to General Electric Company. Method and apparatus for measuring small aspherical particles. 3,815,022, Cl. 324-71.0cp.

Goodchild, Keith Trevor; and Merrill, Harold Edward, to British Steel Corporation. Cropping metal sections to length. 3,813,973, Cl. 83-42.000.

Goodman, David S.: *See—*
Anhalt, John W.; and Goodman, David S., 3,815,077.

Goodnight, Hershel E.: *See—*
Zink, John Smith; Reed, Robert D.; and Goodnight, Hershel E., 3,814,567.

Goodyear Tire & Rubber Company, The: *See—*
Woodhall, Edwin S., 3,814,780.

Gopperton, Ardath A., to Paymaster Corporation, The. Alarm apparatus for office equipment. 3,815,117, Cl. 340-280.000.

Gordon, David A.: *See—*
Seltzer, Raymond; Gordon, David A.; and Sherman, Paul D., 3,814,719.

Gordon, Maxwell, to Bristol-Myers Company. Sustained release contraceptive composition and method of use. 3,814,809, Cl. 424-19.000.

Gordon, Roay: *See—*
Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roay, 3,814,698.

Gordon, Walter H., Jr.; and Ryckman, William D., Jr., to General Electric Company. Overtemperature control system. 3,814,899, Cl. 219-212.000.

Goring Kerr Limited: *See—*
Kerr, Bruce Goring, 3,815,021.

Gospodar, Reinhard, to Volkswagenwerk Aktiengesellschaft. Combustion engine with additional air inlet valve. 3,814,065, Cl. 123-26.000.

Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Piezoelectric smoker's lighter. 3,814,571, Cl. 413-132.000.

Gott, Hans; Ritter, Klaus; Ritter, Josef; and Ritter, Gerhard, to EVG Entwicklungs- und Verwertungs Gesellschaft m.b.H. Wire mesh welding machine. 3,814,145, Cl. 140-112.000.

Gough, Robert G., to Cincinnati Milacron Inc. Methoxy carboxylic acid ester ultraviolet stabilizers for polymers. 3,814,729, Cl. 260-45.85b.

Gould Inc.: *See—*
Oswald, Thomas L.; and Wolf, Alby H., 3,813,922.

Gower, William, to Ecolonet, Inc. Trash receiver. 3,814,150, Cl. 141-337.000.

Grace, Rex C.: *See—*
Zeunen, Barthel; Grace, Rex C.; and Dunn, Alvie R., 3,814,519.

Grace, W. R., & Co.: *See—*
Scott, Peter H., 3,814,637.

Grafton, David A.: *See—*
Douglas, James R.; Adams, Lloyd M.; Mycek, Edward G.; and Grafton, David A., 3,814,514.

Graham, MacKellar K.: *See—*
Aspinwall, Ronald A.; and Graham, MacKellar K., 3,814,251.

Grain Processing Corporation: *See—*
Olson, Robert L.; and Frazeir, Dean R., 3,814,748.

Granatek, Alphonse Peter: *See—*
Granatek, Edmund Stanley; Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,814,800.

Granatek, Edmund Stanley; Kaplan, Murray Arthur; and Granatek, Alphonse Peter, to Bristol-Myers Company. Antibacterial Composition. 3,814,800, Cl. 424-271.000.

Grant, Louis A., Inc.: *See—*
Meyers, Leo J., 3,814,407.

Grantham, Max Edward, to Tecalemit (Engineering) Ltd. Valve assembly having an actuator with a camming ball. 3,814,128, Cl. 137-624.130.

Graphic Arts Packaging Corp.: *See—*
Smith, William Paul, 3,814,303.

Grati-Garelli S.p.A.: *See—*
Agrati, Franco, 3,814,891.

Graveson, Robert T.: *See—*
Guggenheim, S. Frederic; and Graveson, Robert T., 3,814,552.

Gray, John M.: *See—*
Mould, Peter R.; and Gray, John M., 3,814,636.

Gray, Robert. Amphibious vehicles. 3,814,045, Cl. 115-1.00r.

Gray Tool Company: *See—*
Hull, John L., Jr., 3,814,179.

Great Lakes Carbon Corporation: *See—*
Gazda, Irving William, 3,814,828.

Green, Brian Noel, to Associated Electrical Industries Limited. Mass spectrometers and mass spectrometry. 3,814,936, Cl. 250-295.000.

Green, Harold A.; and Petrella, Robert G., to Air Products and Chemicals, inc. Low temperature epoxy curing accelerators special tertiary amine salts. 3,814,764, Cl. 260-268.00t.

Green, Terence C.: *See—*
Martin, Paul E.; Sherrill, William M.; and Green, Terence C., 3,815,135.

Greenaway, David Leslie: *See—*
Russell, John Patrick; and Greenaway, David Leslie, 3,814,904.

Greenberg, Leonard E.: *See—*
Diemond, Joseph; and Greenberg, Leonard E., 3,813,702.

Greenblatt, Irwin; and Marino, Nicholas A., to Sears, Roebuck and Co. Brassiere. 3,814,107, Cl. 128-480.000.

Greenlee Bros. & Company: *See—*
Hagemeyer, Kenneth L., 3,813,914.

Greenwood, Roger; and Roberts, Thomas A., to International Telephone and Telegraph Corporation. Combustion valve and components thereof. 3,814,132, Cl. 137-625.640.

Greer, Jimmy E., to Guardian Industries Corporation. Photographic print cutter. 3,813,976, Cl. 83-211.000.

Gregory, Warren B. Controlled, misted oxygen dispenser. 3,814,093, Cl. 128-210.000.

Grieb, Hubert: *See—*
Bruder, Werner; and Grieb, Hubert, 3,813,874.

Griffin, Auburn K., Jr.: *See—*
Ramsey, James E., Jr.; and Griffin, Auburn K., Jr., 3,815,027.

Griffin, John H., to Marguette Electronics, Inc. Tape speed compensation circuit. 3,815,035, Cl. 329-136.000.

Grill, William Augustus: *See—*
Brady, John Francis; and Grill, William Augustus, 3,814,504.

Grimes, Alton O., to Bendix Corporation, The. Reversing command modifier. 3,814,352, Cl. 244-77.00b.

Grimm, Eberhard: *See—*
Goldammer, Georg; Grimm, Eberhard; and Egli, Emil, 3,813,866.

Gritz, Darrell D., to Jacuzzi Bros. Incorporated. Pump systems for liquids. 3,814,543, Cl. 417-26.000.

Grob, Theodore. Web thinning machine. 3,813,822, Cl. 51-90.000.

Grosch, Hermann; and Oelbe, Hans-Werner, to Fischer & Porter Company. Electrode holder for electromagnetic flowmeters. 3,813,938, Cl. 73-194.0em.

Gross, Charles Henry: *See—*
McCardle, Arthur, Jr.; Sponseller, Robert Lee; and Gross, Charles Henry, 3,814,325.

Grosseau, Albert, to Societe Anonyme Automibiles Citroen. Device for mounting an element on a support. 3,814,928, Cl. 240-57.000.

Grotloh, Karlheinz, to Sulzer Brothers Ltd. Shut-off valve and control system therefor. 3,814,375, Cl. 251-28.000.

Grunert, Kurt A.; and Dauer, John J., Jr., to Westinghouse Electric Corporation. Interlock system for electrical contactors. 3,815,063, Cl. 335-160.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Eddy, John W., 3,814,862.
Vrba, James J.; and Buedel, Charles K., 3,814,859.

GTE Information Systems Incorporated: *See—*
Schwartz, William F.; and Butler, Robert W., 3,815,122.

GTE International Incorporated: *See—*
Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, 3,814,990.

GTE Sylvania Incorporated: *See—*
Kruszewski, William Frank, 3,814,843.
Osborn, Dale B.; and Hill, William R., 3,814,507.

GTI Corporation: *See—*
Hetzer, Harry Depew; and Consentino, Augustine V., 3,814,135.

Guardian Industries Corporation: *See—*
Greer, Jimmy E., 3,813,976.

Guggenheim, S. Frederic; and Graveson, Robert T., to United States of America, Atomic Energy Commission. Personal air sampling pump. 3,814,552, Cl. 417-413.000.

Guglietti, Henry G., to Plastic Materials Systems, Inc. Method for vibrating blending of fluid particulate materials. 3,814,386, Cl. 259-2.000.

Guigues, Frederic; and Pillard, Marcel T. Apparatus for automatic correction of the positioning control of a burner. 3,814,570, Cl. 413-76.000.

Guldberg, Jens: *See—*
Nathanson, Harvey C.; Thomas, Richard N.; and Guldberg, Jens, 3,814,968.

Gulf Research & Development Company: *See—*
Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., 3,814,682.
Christman, Robert D.; McKinney, Joel D.; and Wilson, Geoffrey R., 3,814,683.
Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., 3,814,684.
Gilbert, Ronald E.; Jones, Joseph W., Jr.; and Henry, Raymond M., 3,814,737.
McKinney, Joel D.; and Paraskos, John A., 3,814,681.

Gunther, Robert C., to Staley, A. E., Manufacturing Company, mesne. Vegetable aerating proteins. 3,814,816, Cl. 426-46.000.

Gushing, Nagle V.: *See—*
Kuck, Kermit T.; and Gushing, Nagle V., 3,813,745.

Gustafson, August W. Therapuetic device. 3,814,084, Cl. 128-25.00r.

Gustav Schade Maschinenfabrik: *See—*
Fischer, Gerhard; and Strucker, Gunter, 3,814,268.

Guth, Lauren W., to General Electric Company. Washing appliance with temperature indicating means. 3,813,942, Cl. 73-343.00r.

Habash, Michael B., to Advanced Extrusions Limited. Method of forming a tapered container. 3,814,040, Cl. 113-120.00m.

Habegger, Richard J.: *See—*
Fields, Harold T.; and Habegger, Richard J., 3,813,754.

Habermeier, Juergen; and Porret, Daniel, to Ciba-Geigy AG. 3-Glycidyl-hydantoin isocyanates. 3,814,775, Cl. 260-309.500.

Hackman, Frank C., to Mueller Co. Rotary valve with anti-corrosion and torque controlling means. 3,814,379, Cl. 251-297.000.

Hadam, Wilhelm. Magnetic armature for magnetic arrangements subject to impact stresses. 3,815,065, Cl. 335-257.000.

Haden, Billy Harper: *See—*
Blake, Kenneth Allen; Haden, Billy Harper; Hendershot, William Fred; and Johnson, La Vell Rolfson, 3,814,668.
Freade, Ronald; and Haden, Billy Harper, 3,814,670.

Hafer, Richard F.: *See—*
Shockley, Gilbert R.; and Hafer, Richard F., 3,814,423.

Haferl, Peter Eduard, to RCA Corporation. S-corrected waveform generator. 3,814,980, Cl. 315-27.0gd.

Hagemeyer, Kenneth L., to Greenlee Bros. & Company. Bending apparatus. 3,813,914, Cl. 72-318.000.

Haight, William John: *See—*
Critchley, John Edward; and Haight, William John, 3,814,865.

Halek, George W.: *See—*
Gall, John S.; and Halek, George W., 3,814,786.

Haley, Alan W. Passive reradiator of radio-frequency electromagnetic energy. 3,815,138, Cl. 343-754.000.

Hall, William Arthur: *See—*
Bemrose, Colin Raymond; Hall, William Arthur; and Williams, Eirug Ellis, 3,813,752.

Halland, Howard M.: *See—*
Orbison, Frank H.; and Halland, Howard M., 3,814,665.

Haller, Ivan: *See—*
Aviram, Arieh; Haller, Ivan; Miller, Robert D.; and Young, William R., 3,814,700.

Haller, Jacob: *See—*
Bennett, William P.; and Haller, Jacob, 3,814,343.

Halliburton Company: *See—*
Giroux, Richard L., 3,814,182.

Hamaguchi Indicator Industry Co., Ltd.: *See—*
Nishi, Koji; Kumakura, Itsuo; and Hamaguchi, Ukio, 3,813,806.

Hamaguchi, Ukio: *See—*
Nishi, Koji; Kumakura, Itsuo; and Hamaguchi, Ukio, 3,813,806.

Hamburg, Jacob J., to Admiral Marine Products Company. Kitchen sink strainer and drain bowl unit. 3,813,708, Cl. 4-286.000.

Hamlet, John F., to United States of America, National Aeronautics and Space Administration. LC-oscillator with automatic stabilized amplitude via bias current control. 3,815,048, Cl. 331-109.000.

Hammes, Paul A.: *See—*
Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., 3,813,817.
Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., 3,814,817.

Hammond, Joseph: *See—*
Frederickson, Robert Eugene; and Hammond, Joseph, 3,813,776.

Hanes, Arnold Loyd. Rotary internal combustion engine. 3,814,064, Cl. 123-8.170.

Hansen, Arne, to Kidde, Walter, & Company, Inc. Safety release pin. 3,814,298, Cl. 222-153.000.

Hansen, Norbert Ernst Fritz; and Littmann, Walter Fritz Konrad, to U.S. Philips Corporation. Method of manufacturing a luminescent screen of a color television display tube. 3,814,629, Cl. 117-211.000.

Hansgen, Klaus: *See—*
Hiersig, Heinz M.; Hansgen, Klaus; Ridder, Gerhard; and Sudhoff, Wolfgang, 3,813,897.

Hanson, Raymond; and Vinter, Sydney A., to USM Corporation. Die construction. 3,814,656, Cl. 156-380.000.

Hara, Toshito: *See—*
Inoue, Kozo; Hara, Toshito; Kitazawa, Takeo; Yamamoto, Kazuyoshi; and Oguma, Toshiro, 3,814,612.

Harada, Kenichi, to Olympus Optical Co., Ltd. Equi-magnification copying lens. 3,814,505, Cl. 350-214.000.

Hardin, Bobby O.; and Thurman, Woodrow W., to University of Kentucky Research Foundation, The, mesne. Resonant footing test apparatus. 3,813,929, Cl. 73-84.000.

Harnden, John D., Jr.: *See—*
Bowers, David L.; Heidtmann, Donald S.; and Harnden, John D., Jr., 3,814,888.

Harnischfeger Corporation: *See—*
Miller, Mickey J., 3,814,265.

Harrell, Bob G.; Wenta, Peter J.; and Linsin, Russell J., to Jackes-Evans Manufacturing Company. Method of expanding metal. 3,813,743, Cl. 29-6.200.

Harrington, Herbert A., to HMR Enterprises, Inc. Cotton harvester. 3,813,857, Cl. 56-13.100.

Harris, Peter John; Holmes, Barry Stanford; and Ryder, John Lee, to GKN Birwelco Limited. Steam condensers. 3,814,177, Cl. 165-110.000.

Harris, Robin Bruce, to Hydrostatic Transmissions Limited. Fluid pressure machines. 3,813,995, Cl. 91-488.000.

Harrold, Ronald T., to Westinghouse Electric Corporation. Hybrid circuit interrupter. 3,814,882, Cl. 200-144.00b.

Hart, Maurice W., Jr. Process for bonding fabric and other carriers to highly plasticized polyvinyl chloride using a fire-retarding adhesive. 3,814,661, Cl. 161-191.000.

Hartmann & Braun Aktiengesellschaft: *See—*
Gast, Theodor; Twisselmann, Lorenz; and Marx, Wolf-Rudiger, 3,815,018.

Hartmann, Peter; Redetzky, Wolfgang; Roos, Ernst; and Kempermann, Theo, to Bayer Aktiengesellschaft. Ozone-resistant odorless vulcanizates. 3,814,727, Cl. 260-45.90r.

Hasegawa, Tadashi: *See—*
Matsumura, Taroemon; and Hasegawa, Tadashi, 3,814,965.

Hasegawa, Yasuhiro: *See—*
Takahashi, Ikuo; and Hasegawa, Yasuhiro, 3,814,131.

Hashida, Taizo; Okumura, Masaru; and Fujishima, Hiroyasu, to Toyo Rubber Industry Co., Ltd., The. Pneumatic tire. 3,814,162, Cl. 152-361.0dm.

Hashimoto, Jusuke. Latherer for soap liquid. 3,814,697, Cl. 252-359.00c.

Hashimoto, Juzo; Kawamoto, Hisashi; Kanbara, Isao; Inoue, Akira; and Kitajima, Akira, to Ezaki Glico Kabushiki Kaisha, The. Method of manufacturing gum bases. 3,814,815, Cl. 426-3.000.

Hashimoto, Makoto: *See—*
Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, 3,814,778.

Hastings Manufacturing Company: *See—*
Johnson, Stephen I.; and Thompson, Harry B., 3,814,444.

Hata, Kazuhiko: *See—*
Yagi, Yoshiharu; Narisawa, Shizuo; Oshima, Takao; and Hata, Kazuhiko, 3,814,744.

Hatch, Burton D., to General Electric Company. High torque cryogenic coupling. 3,813,898, Cl. 64-15.00r.

Hauptmann, Gunter: *See—*
Moller, Friedrich; Muhlhausen, Cornelius; and Hauptmann, Gunter, 3,814,707.

Havstad, Harold R., to Hudson Oxygen Therapy Sales Co. Cope apparatus for molding nasal cannulae. 3,814,373, Cl. 249-176.000.

Hawkes, David Alec: *See—*
Voice, Ernest Wallace; and Hawkes, David Alec, 3,814,596.

Hawthorne, Vaugn T., to Keystone Industries, Inc. Return spring unit for a railway car. 3,814,266, Cl. 213-8.000.

Hayashi, Kunihisa; and Fujimoto, Norihiro, to Toyo Kogyo Company Limited. Profile grinder. 3,813,818, Cl. 51-34.00a.

Hayes, John C.; and Sobel, Jay E., to Universal Oil Products Company. Making alumina fibers from a mixture of alumina sol and hexamethylenetetramine. 3,814,782, Cl. 264-63.000.

Hayman, Cecil: *See—*

Lewin, Ronald Harvey; and Hayman, Cecil, 3,814,625.

Haynes, James N., to Hercules Incorporated. Azidoformates and their use. 3,814,657, Cl. 161-144.000.

Hayo, Frank J., to Metrophysics, Inc. Near field target discrimination and intrusion detection system. 3,815,130, Cl. 343-5.0pd.

Head, Victor P., to Fischer & Porter Co. Tag-sensing flowmeters. 3,813,939, Cl. 73-194.00e.

Heap, Harry Rodney; and Riley, Colin Charles, to English Electric Company Limited. Method of brazing. 3,813,759, Cl. 29-472.700.

Heberlein & Co. AG: *See*—
Ritter, Helmut, 3,813,863.

Heidtmann, Donald S.: *See*—
Bowers, David L.; Heidtmann, Donald S.; and Harnden, John D., Jr., 3,814,888.

Heier, Wilbur C., to United States of America, National Aeronautics and Space asministration. Method of laminating structural members. 3,814,653, Cl. 156-285.000.

Heijnis, James W. Ij., to Akzona Incorporated. Tow guide for stuffer bot crimping. 3,813,740, Cl. 28-1.600.

Heikes, Norman L. Cervical harness. 3,814,087, Cl. 128-75.000.

Heiler, Wolfgang; Muller, Rudolf; and Becker, Jean-Jacques, to Vestra-Union S.A. Automatic guide device for sewing machine or machine for assembling two or more superposed elements. 3,814,039, Cl. 112-153.000.

Heimbuch, Alvin H.: *See*—
Parker, John A.; Dimeff, John; and Heimbuch, Alvin H., 3,814,939.

Hein, Dieter: *See*—
Prinzhorn, Kaus; and Hein, Dieter, 3,813,765.

Hein, Richard D.: *See*—
Britton, James E.; Welch, John A.; and Hein, Richard D., 3,814,412.

Heisler, Raymond A. Apparatus for automatically feeding and erecting folded cartons. 3,814,000, Cl. 93-53.0sd.

Heitland, Herbert, to Volkswagenwerk Aktiengesellschaft. Converter for catalytic exhaust gas cleaning. 3,814,589, Cl. 23-288.00f.

Heimann, Knut, to Leitz, Ernst G.m.b.H. Vibratory alignment system for lenses in mountings. 3,814,958, Cl. 310-8.100.

Helbert, William B., Jr.: *See*—
United States of America, National Aeronautics and Space Administration, 3,814,645.

Helms, James K.; and Fischer, Robert K., to Westinghouse Electric Corporation. Electrode-feeding device for an electrical discharge machining apparatus. 3,814,893, Cl. 219-69.00e.

Hendershot, William Fred: *See*—
Blake, Kenneth Allen; Haden, Billy Harper; Hendershot, William Fred; and Johnson, La Vell Rolfson, 3,814,668.

Hengstebeck, Robert J., to Standard Oil Company. Centrifugal clarifier. 3,814,307, Cl. 233-31.000.

Henkin, Melvyn. Anesthesia rebreathing apparatus. 3,814,091, Cl. 128-188.000.

Henning, Steven A., to American Playground Device Co. Slide. 3,814,418, Cl. 272-56.50r.

Henry, Raymond M.: *See*—
Gilbert, Ronald E.; Jones, Joseph W., Jr.; and Henry, Raymond M., 3,814,737.

Henthorn, Larry J.; and Kines, Frank R., to Quaker Oats Company, The. Process for preparing a coated ready-to-eat breakfast cereal. 3,814,822, Cl. 426-293.000.

Heraeus-Christ GmbH: *See*—
Wutz, Max; and Sinn, Hartmut, 3,814,306.

Herbst, David R.; and Smith, Herchel, to American Home Products Corporation. Indole fused heterocyclic anti-inflammatory compounds. 3,814,773, Cl. 260-295.00a.

Hercules Incorporated: *See*—
Haynes, James N., 3,814,657.

Herman, Martin Andrew. Gauge adapter. 3,813,786, Cl. 33-174.00p.

Hertel, Karl. Cutting tool. 3,813,747, Cl. 29-96.000.

Herter, George L., to Herter's, Inc. Pheasant call. 3,813,811, Cl. 46-180.000.

Herter's, Inc.: *See*—
Herter, George L., 3,813,811.

Hertler, Walter R., to Du Pont de Nemours, E. I., and Company. Photoimaging systems based upon photosensitized rearrangement of N-vinylsulfonomides to β-sulfonylvinylamines. 3,814,604, Cl. 096-048.00r.

Hess, Hans-Jurgen E.: *See*—
Cronin, Timothy H.; and Hess, Hans-Jurgen E., 3,814,760.

Hess, Hans-Jurgen E.; and Nelson, Roger P., to Pfizer Inc. 11-Deoxoglycyrrhetinic acid piperazides useful as antiulcer agents. 3,814,766, Cl. 260-268.0pc.

Hesser, Fr., Machinenfabrik A.G.: *See*—
Stambera, Adolf; and Leich, Rolf, 3,813,849.

Hesser, Fr., Maschinenfabrik AG: *See*—
Kuhnle, Paul, 3,813,847.

Hester, William A., to Eastex Packaging, Inc. Handle for carton. 3,814,304, Cl. 229-52.0al.

Hetzer, Harry Depew; and Consentino, Augustine V., to GTI Corporation. Hose and tubing assembly closures. 3,814,135, Cl. 138-89.000.

Hewitt, Terry L., to General Electric Company. Electronic random-access slide projector controller. 3,814,909, Cl. 235-92.0mp.

Hewitt, William Lloyd, to Cam Stat Incorporated. Interlock circuit. 3,814,991, Cl. 317-141.00s.

Hi-Shear Corporation: *See*—
Selinder, Eric P., 3,813,984.

Hibbing, Edwin Ernst; and Preisler, Frank, to Johns-Manville Corporation. Apparatus and method for cutting holes in roofing sheet material. 3,813,977, Cl. 83-345.000.

Hiersig, Heinz M.; Hansgen, Klaus; Ridder, Gerhard; and Sudhoff, Wolfgang, to Mannesmann-Meer Aktiengesellschaft. Resilient shaft coupling for ready assembly and disassembly. 3,813,897, Cl. 64-13.000.

Highberg, Carle W.; and Roesch, George R., to Englehard Minerals & Chemicals Corporation. Sheet glass core drilling machine. 3,813,820, Cl. 51-81.000.

Hilberath, Freidrich: *See*—
Erlmeier, Robert; Hilberath, Freidrich; Meisenburg, Ewald; and Spengler, Gunter, 3,814,679.

Hilberg, Ronald P.: *See*—
Hook, William R.; Dishington, Roland H.; and Hilberg, Ronald P., 3,815,044.

Hill, Ernest C.; and Patterson, Charles T., to Combustion Engineering, Inc. Separator. 3,813,855, Cl. 55-440.000.

Hill, James E., to Imperial Manufacturing Company. Mouthpiece for a snorkel. 3,814,090, Cl. 128-145.00a.

Hill, Robert T., to General Motors Corporation. Air vent in vehicle compartment panel. 3,814,001, Cl. 98-2.000.

Hill, William R.: *See*—
Osborn, Dale B.; and Hill, William R., 3,814,507.

Hillinger, Hermann: *See*—
Wilmers, Gottlieb; and Hillinger, Hermann, 3,814,556.

Hinde, Adrian L., to Chamber of Mines Services (Properties). Wet sieving. 3,813,947, Cl. 73-432.0ps.

Hines, Harold L., Jr., to United States of America, Army. Expansile protective cap for fluidic ordnance fuzed. 3,814,019, Cl. 102-91.000.

Hiraishi, Kiyoto: *See*—
Hori, Yasuro; Hiraishi, Kiyoto; Kiuchi, Tadashi; and Kashima, Yoshitake, 3,815,068.

Hirano, Reiji: *See*—
Kimura, Takehiko; Niizawa, Yoshiki; and Hirano, Reiji, 3,815,098.

Hirano, Tadao; Toda, Sadasuke; and Okugawa, Katuo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for preventing the driving of an automobile or the like when the operator is under the influence of alcohol. 3,815,087, Cl. 340-53.000.

Hirooka, Masaaki: *See*—
Kawasumi, Shohachi; Hirooka, Masaaki; and Yabuuchi, Hiroshi, 3,814,734.

Hirose, Masakazu, to Jeco Kabushiki Kaisha. Clock utilizing a magnetic escapement mechanism. 3,813,871, Cl. 58-23.00v.

Hirowatari, Tomoyuki; Kurihara, Tomomichi; Kokumai, Akihisa; Hori, Toru; and Tanimoto, Takaaki, to Hitachi Shipbuilding and Engineering Co., Ltd. Submarine tank and method of fabricating. 3,814,042, Cl. 114-.50t.

Hirs, Gene, to Hydromation Filter Company. Method of filtering. 3,814,245, Cl. 210-74.000.

Hirs, Gene, to Hydromation Filter Company. Method of filtering. 3,814,247, Cl. 210-80.000.

Hirs, Gene, to Hydromation Filter Company. Liquid filter apparatus. 3,814,688, Cl. 210-297.000.

Hirst, Richard William; and Brooks, Conrad Stone, to Deere & Company. Lock for an oscillatable axle. 3,814,200, Cl. 180-41.000.

Hitachi, Ltd.: *See*—
Hori, Yasuro; Hiraishi, Kiyoto; Kiuchi, Tadashi; and Kashima, Yoshitake, 3,815,068.
Ito, Tyoichi, 3,815,045.
Itoh, Yokichi; and Sunami, Hideo, 3,814,955.
Misumi, Akira; and Kasai, Toshiaki, 3,814,966.
Mitobe, Koichi; and Abe, Katsuo, 3,814,976.
Shiragai, Yasuo; and Macno, Takeshi, 3,814,494.
Takahashi, Susumu; Sato, Hitoshi; and Kaneko, Yoichi, 3,814,997.
Takahashi, Yoshinori; and Takizawa, Masao, 3,814,215.
Takata, Masanobu; Osakabe, Kuniharu; and Murata, Yoshio, 3,814,967.
Watatani, Yoshizumi; and Mohri, Katsuo, 3,815,052.

Hitachi Shipbuilding and Engineering Co., Ltd.: *See*—
Hirowatari, Tomoyuki; Kurihara, Tomomichi; Kokumai, Akihisa; Hori, Toru; and Tanimoto, Takaaki, 3,814,042.

HMR Enterprises, Inc.: *See*—
Harrington, Herbert A., 3,813,857.

Hochwitz, L nn E.: *See*—
Price, Warren H.; and Hochwitz, Lynn E., 3,813,954.

Hockemeyer, Friedrich: *See*—
Nitzsche, Siegfried; Marwitz, Heinrich; and Hockemeyer, Friedrich, 3,814,731.

Hodge, Marvin S. Doorframe sander. 3,813,830, Cl. 51-392.000.

Hodges, Kenneth James Hamer: *See*—
Repton, Charles Samuel; Venton, Peter Charles; and Hodges, Kenneth James Hamer, 3,814,919.

Hodgson, Brian, to Machine Tool Divisional Services Limited. Gear hobbing machine. 3,813,988, Cl. 90-2.000.

Hodgson, Duncan Barry: *See*—
Ironside, John Michael; Hodgson, Duncan Barry; and Bertioli, Michael Murray, 3,814,913.

Hodsall, Brian: *See*—
Labbe, Francis A. M.; Preston, Edward G.; Hodsall, Brian; and Marritt, Clifford R., 3,813,996.

Hoerner Waldorf Corporation: *See*—
Dick, Raymind S.; and Klitzke, Loren J., 3,814,650.

Hoey, George B.; Peckels, Donald R.; and Wiegert, Philip E., to Mallinckrodt Chemical Works. Catalyzed radioiodine exchange. 3,814,769, Cl. 260-288.00a.

Hoffler, George W.: *See*—
United States of America, National Aeronautics and Space Administration, 3,814,083.

Hoffman, Joseph J., to Bear Mfg. Corporation. Rope climbing device. 3,814,210, Cl. 182-6.000.

Hoffmann, Andre A.: *See*—
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E., 3,814,356.

Hoffmann-La Roche Inc.: *See*—
Free, John Marshall, 3,814,521.
Osbond, John Mervyn; and Wickens, James Charles, 3,814,805.
Wang, Su-Sun, 3,814,732.

Hogg, Walter R., to Coulter Electronics, Inc. Pulse width stabilizing method and apparatus. 3,815,023, Cl. 324-71.0cp.

Hohloch, Kurt, to Zinser-Textilmaschinen GmbH. Apparatus for the pickup of thread ends from a bobbin. 3,813,865, Cl. 57-34.500.

Hohman, William H.: *See*—
Woods, Richard E.; and Hohman, William H., 3,815,006.

Holdstock, Norman G.: *See*—
Simoneau, Edward T.; Moeller, Ricahrd E.; and Holdstock, Norman G., 3,814,706.

Holland Company: *See*—
Chierici, Osvaldo F., 3,814,267.

Holman, George B., to Amoco Production Company. Subsurface formation plugging. 3,814,187, Cl. 166-281.000.

Holmen, James O.; and Ulmer, Robert P., to Honeywell Inc. and Plated wire memory element. . 3,814,591, Cl. 29-194.000.

Holmes, Barry Stanford: *See*—
Harris, Peter John; Holmes, Barry Stanford; and Ryder, John Lee, 3,814,177.

Holmlund, Henrik; and Kareby, Erik, to Aktiebolaget Vibro-verken Solna. Regulator for pneumatic vibrator. 3,814,385, Cl. 259-1.00r.

Holtey, Thomas O.; and Patel, Lallubhai O., to Honeywell Information Systems, Inc. Memory presence checking apparatus. 3,815,103, Cl. 340-172.500.

Homestead Industries, Inc.: *See*—
Mulholland, Terence H.; and Kruger, Fred B., 3,814,321.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hirano, Tadao; Toda, Sadasuke; and Okugawa, Katuo, 3,815,087.

Honda, Toshio; Kobota, Eishi; Tanaka, Shoji; and Fukuura, Yokio, to Bridgestone Tire Company Limited. Adhesive composition. 3,814,713, Cl. 260-29.300.

Honeywell Inc.: *See*—
Ellis, William D.; and Mulvaney, Bruce D., 3,814,687.
Holmen, James O.; and Ulmer, Robert P., 3,814,591.
Hurd, Edward T. E., III; and Stern, David M., 3,814,227.
Jacobsz, Roelof F., 3,814,569.
Schmit, Francis M., 3,815,151.

Honeywell Information Systems, Inc.: *See*—
Holtey, Thomas O.; and Patel, Lallubhai O., 3,815,103.
Nibby, Chester M.; and Manton, John C., 3,814,921.
Nibby, Chester M.; Manton, John C.; Franklin, Benjamin S.; and Curley, John L., 3,814,922.
Rich, Dennis E., 3,813,979.

Honeywell Invormation Systems Inc.: *See*—
Pringle, Anthony, 3,814,860.

Hook, William R.; Dishington, Roland H.; and Hilberg, Ronald P., to TRW Inc. Solid state laser apparatus with auxiliary intra-cavity mirror elements. 3,815,044, Cl. 331-94.50c.

Hoover Ball and Bearing Company: *See*—
Janko, George F., 3,813,710.

Horgan, Stephen W.: *See*—
Andrews, Edwin R.; and Horgan, Stephen W., 3,814,770.

Hori, Toru: *See*—
Hirowatari, Tomoyuki; Kurihara, Tomomichi; Kokumai, Akihisa; Hori, Toru; and Tanimoto, Takaaki, 3,814,042.

Hori, Yasuro; Hiraishi, Kiyoto; Kiuchi, Tadashi; and Kashima, Yoshitake, to Hitachi, Ltd. Stationary induction apparatus. 3,815,068, Cl. 336-100.000.

Horsting, Carle W.: *See*—
Freedman, Norman S.; Horsting, Carle W.; Lawrence, Walter F.; and Carrona, John J., 3,814,633.

Hortman, Norman A. Centrifugal separator having axial-flow vortex generator. 3,813,854, Cl. 55-399.000.

Hoshi, Toshihiro: *See*—
Sasaki, Hajime; Yamagishi, Kazuo; Sakai, Sukeyoshi; and Hoshi, Toshihiro, 3,813,767.

Hoshino, Chikafusa: *See*—
Kobayashi, Sadao; Tazawa, Eiichi; Matsunaga, Mitsuro; Hoshino, Chikafusa; and Kunisaki, Hideo, 3,814,619.

Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, to Furukowa Electric Company Limited and Nissei Kogyo Kabushiki Kaisha. Method for producing a composite foamed article. 3,814,778, Cl. 264-45.000

Howard, Jack D.; Seiffert, Stanley V.; and Wartes, Christopher R., to Physio-Control Corporation. Portable defibrillators including rotary solenoid relays for energy transfer and dumping. 3,814,105, Cl. 128-419.00d.

Howard, William G., Jr.; and Cecil, James B., to Motorola, Inc. Ladder termination circuit. 3,815,123, Cl. 340-347.0da.

Howson-Algraphy Limited: *See*—
Middlemiss, Herbert, 3,814,608.

Hoyt, Earl H., Jr. Take down archery bow with a mount for a bow stabilizing element. 3,814,075, Cl. 124-24.00r.

Hristov, Chavdar Asenov: *See*—
Nikolov, Ivan Dimov; Rasheev, Gueorgui Nikolov; Sivov, Ferdo Atanasov; Nikolov, Nikolai Yonkov; and Hristov, Chavdar Asenov, 3,814,127.

Hruby, Frank R.: *See*—
Nilles, John D.; and Hruby, Frank R., 3,813,782.

Hruby, John O., Jr., to Rain Jet Corp. Illuminated water fountains. 3,814,317, Cl. 239-18.000.

Hubbard, Richard T.: *See*—
Bjorklund, Leon V.; and Hubbard, Richard T., 3,814,419.

Hubble, David H.; and Yount, Joseph G., Jr., to United States Steel Corporation. Coke-oven patching material. 3,814,613, Cl. 106-68.000.

Hubschmann, Karl Wolfgang, to Motoren-Werke Mannheim AG vorm. Benz Abt. Stationarer Motorenbau. Hot-gas engines. 3,813,882, Cl. 60-525.000.

Hubschmann, Karl Wolfgang, to Motoren Werke Mannheim AG Vorm. Benz Abt Stationarer Motorenbau. Seal for a reciprocatory bar. 3,814,553, Cl. 417-511.000.

Huck, George E.: *See*—
Beemer, Paul K.; and Huck, George E., 3,814,374.

Hudson, Ben Avery, to PPG Industries, Inc. Transfer mechanism for high speed winders. 3,814,339, Cl. 242-18.0pw.

Hudson Oxygen Therapy Sales Co.: *See*—
Havstad, Harold R., 3,814,373.

Huelters, Hubert, to Siemens Aktiengesellschaft. Fault diagnosis in pulse controlled devices employing variable clock rate. 3,814,920, Cl. 235-153.0ac.

Hug, Karl, to General Motors Corporation. Safety steering arrangements for motor vehicles. 3,813,961, Cl. 74-492.000.

Hugelshofer, Paul; and Kugler, Fritz, to Ciba-Geigy AG. Process for colouring products of high molecular weight with pigments. 3,814,726, Cl. 260-42.210.

Hughart, Robert P.: *See*—
Wilson, Peter C.; and Hughart, Robert P., 3,814,246.

Hughes Aircraft Company: *See*—
Basiulis, Algerd, 3,814,974.

Hughes, Anthony Edward David: *See*—
Minton, Leslie Graham; and Hughes, Anthony Edward David, 3,815,086.

Hull, John L., Jr., to Gray Tool Company. Well head set screw port exit of control line for down-hole safety valve. 3,814,179, Cl. 166-89.000.

Huls, Ralph M.: *See*—
Cox, George B., Jr.; and Huls, Ralph M., 3,814,575.

Humphreys, Robert Lee; and Spitzer, James Edward, to American Can Company. Apparatus for trimming and finishing plastic jars. 3,814,534, Cl. 408-26.000.

Hundstad, Richard L., to Westinghouse Electric Corporation. Vacuum interrupter contacts having energy dissipation surfaces. 3,814,880, Cl. 200-144.00b.

Hunt, Albert L., Jr.: *See*—
Beam, Paul E., Jr.; Hunt, Albert L., Jr.; and Spears, Esten W., Jr., 3,814,313.

Hunt, Duane A., to Matthews, Donnell R., Jr. Internal combustion engine controls for reduced exhaust contaminants. 3,813,877, Cl. 60-284.000.

Hunter, Dewitt T. Patient identification system. 3,814,049, Cl. 116-114.00r.

Hunter, James, Machine Company, Inc., mesne: *See*—
Brochetti, Raymond E., 3,813,741.

Hunter, James R.; Lazzarotti, S. James; and Kelly, Edward A., Jr., to Burroughs Corporation. Device for aiding the stacking of documents. 3,814,415, Cl. 271-181.000.

Hunter, Robert T.: *See*—
Inamorato, Jack T.; Hunter, Robert T.; and Dickson, Robert E., 3,814,705.

Hurd, Edward T. E., III; and Stern, David M., to Honeywell Inc. Matrix print rotation. 3,814,227, Cl. 197-1.00r.

Huret, Jacques Andre: *See*—
Huret, Roger Henri; and Huret, Jacques Andre, 3,813,957.

Huret, Jacques Andre; and Huret, Roger Henri Marius. Device for the accurate control of translatory movement and in particular of the translatory displacement of a bicycle chain from one chain wheel to the other. 3,813,955, Cl. 74-217.00b.

Huret, Roger Henri; and Huret, Jacques Andre. Device for guiding cales on cycles. 3,813,957, Cl. 74-240.000.

Huret, Roger Henri Marius: *See*—
Huret, Jacques Andre; and Huret, Roger Henri Marius, 3,813,955.

Hurlbrink assor. to Bell Telephone: *See*—
Hurlbrink, Robert William, III; and Montone, Liber Joseph, 3,814,845.

Hurlbrink, Robert William, III; and Montone, Liber Joseph, said Hurlbrink assor. to Bell Telephone. Object positioning. 3,814,845, Cl. 178-6.800.

Hurwitz, Alexander. Air cushion supports for vehicle seats. 3,814,370, Cl. 248-400.000.

Hutchinson, John J.: *See*—
Klumb, Ralph H.; and Hutchinson, John J., 3,814,667.

Hybrid Systems Corporation: *See—*
Wilensky, Samuel, 3,815,121.
Hydromation Filter Company: *See—*
Hirs, Gene, 3,814,245.
Hirs, Gene, 3,814,247.
Hirs, Gene, 3,814,688.
Hydrostatic Transmissions Limited: *See—*
Harris, Robin Bruce, 3,813,995.
Hyper-Loop, Inc.: *See—*
Sommeria, Marcel R., 3,815,004.
I-T-E Imperial Corporation: *See—*
Cronin, John C.; and Dodge, David S., 3,814,830.
Cronin, John C., 3,814,832.
McConnell, Lorne D., 3,814,884.
Stetsuk, Paul, 3,815,058.
Ichimura, Hiroshisa; and Irie, Namio, to Nissan Motor Company, Limited. Control system for an automotive automatic power transmission. 3,813,964, Cl. 74-866.000.
Iglesias, Edmundo J.; and Mayer, Robert, to Sun oil Company of Pennsylvania. Automatic pump shutdown circuit. 3,814,542, Cl. 417-12.000.
Iinney, Richard D.: *See—*
Rand, Douglas R.; Iinney, Richard D.; Woods, Charles R.; and Smith, Edward M., 3,813,980.
Iisch, Thomas A.; and Jenkins, Thomas A., to Electro Print, Inc. Electrostatic printing system and method using a moving shutter area for selective mechanical and electrical control of charged particles. 3,815,145, Cl. 346-74.0eb.
IJR Inc. (Inoue-Japan Research Inc.): *See—*
Inoue, Kiyoshi, 3,815,115.
Ikeda, Tomoaki: *See—*
Shinozaki, Fumiaki; Ikeda, Tomoaki; Makaida, Yoshito; and Tsuboi, Masayoshi, 3,814,602.
Ille Electric Corporation: *See—*
Lemb, John, 3,814,086.
Illinois Tool Works, Inc.: *See—*
Jones, Chesley, 3,815,081.
Ilon, Bengt Erland. Vehicle for use on land, in water, on ice and in snow. 3,814,046, Cl. 115-1.00r.
Imai, Masaji: *See—*
Kamimura, Seigoro; Imai, Masaji; and Azegami, Takeo, 3,814,259.
Imperial Chemical Industries Limited: *See—*
Duncan, David Gray, 3,814,710.
Ganderton, David; McAinsh, James; and Varney, Gordon, 3,814,097.
Jones, Michael Edward Benet, 3,814,791.
Reade, Graham Melvin, 3,814,785.
Imperial Manufacturing Company: *See—*
Hill, James E., 3,814,090.
Improved Machinery Inc.: *See—*
Carlsmith, Lawrence A., 3,814,664.
Inamorato, Jack T.; Hunter, Robert T.; and Dickson, Robert E., to Colgate-Palmolive Company. Low-foaming detergent compositions. 3,814,705, Cl. 252-525.000.
Inamura, Keizo: *See—*
Kondo, Taizo; Inamura, Keizo; and Kamimura, Masaaki, 3,814,616.
Indusco Corporation: *See—*
Locricchio, Joseph J., 3,814,371.
Industria Macchine Automatiche S.p.A.: *See—*
Romagnoli, Andrea, 3,813,848.
Industria Tehnico Medicala: *See—*
Simionescu, Radu; Manof, Alexandru-Ioan-Bogdan I.; and Nita, Constantin T., 3,814,092.
Industrial Filter & Pump Mfg. Co.: *See—*
Schmidt, Henry, Jr., 3,814,257.
Ingemarsson, Gosta Ingemar, to Aktiebolaget Karlstads Mekaniski Werkstad. Method and apparatus for the continuous digestion of cellusosic materials. 3,814,663, Cl. 162-60.000.
Innovations Incorporated: *See—*
Rudat, Emil A.; and Medler, Edwin J., 3,814,033.
Inoue, Akira: *See—*
Hashimoto, Juzo; Kawamoto, Hisashi; Kanbara, Isao; Inoue, Akira; and Kitajima, Akira, 3,814,815.
Inoue, Katashi, to Fuji Kuuki Kabushiki Kaisha. Air exhauster for a rotary pneumatic machine. 3,814,209, Cl. 181-36.00a.
Inoue, Kiyoshi. Electrode for electrical machining. 3,814,892, Cl. 219-69.00e.
Inoue, Kiyoshi, to IJR Inc. (Inoue-Japan Research Inc.). Method and apparatus for preparing dental cements and cavity-filling composition. 3,815,115, Cl. 340-261.000.
Inoue, Kozo; Hara, Toshito; Kitazawa, Takeo; Yamamoto, Kazuyoshi; and Oguma, Toshiro, to Fujitsu Limited. Glass useful for forming a reed switch sealing tube. 3,814,612, Cl. 106-52.000.
Inoue, Tokuta; Yamada, Mitsumasa; Nakanishi, Kiyoshi; Tanasawa, Yasushi; and Yamaguchi, Shunzo, to Toyota Jidosha Kogyo Kabushiki Kaisha. After-burner for an internal combustion engine. 3,813,879, Cl. 60-303.000.
Institut Po Meteloznanie i Technologia Na Metalite: *See—*
Nikolov, Ivan Dimov; Rasheev, Gueorgui Nikolov; Sivov, Ferdo Atanasov; Nikolov, Nikolai Yonkov; and Hristov, Chavdar Asenov, 3,814,127.
Instituto Sieroterapico Milanese "Serafino Belfanti" Ento Morale: *See—*
De Barbieri, Augusto, 3,814,746.
Instrument Development Laboratories, Inc.: *See—*
Sherman, Philip, 3,813,769.
Intech Corporation: *See—*
Glaze, John W., Jr., 3,814,235.
International Business Machines Corporation: *See—*
Almasi, George S., 3,815,107.
Aviram, Arieh; Haller, Ivan; Miller, Robert D.; and Young, William R., 3,814,700.
Brock, George W.; McCormick, Wayne; and Smith, Sidney H., 3,813,766.
Davis, James Howard; and Dobson, Donald Rhea, 3,815,014.
Jordan, Paul Vincent, 3,815,025.
Kump, Herbert J.; Lambert, Lloyd M., Jr.; and Quinn, Robert M., 3,814,992.
Malaviya, Shashi D., 3,814,953.
Nussbaumer, Henri J., 3,814,917.
O'Day, Richard L.; and Shelledy, Frank B., 3,814,863.
Vinal, Albert W., 3,815,066.
International Computers Limited: *See—*
Derc, Roman, 3,814,012.
International Flavors & Fragrances Inc.: *See—*
Mookherjee, Braja D., 3,814,704.
International Harvester Company: *See—*
Aarons, Geoffrey L.; and DeWeese, Ralph M., 3,814,411.
International Magna Corporation: *See—*
Karlovetz, Arthur Raymond, 3,814,573.
International Minerals & Chemical Corporation: *See—*
Boeglin, Albert F.; and Chowning, Edward A., 3,814,595.
International Nickel Company, Inc.: *See—*
Cometto, Dante James; Morse, Jeremy Painter; Crickmer, Robert Edward; and Kirk, Irvin, 3,814,635.
International Nickel Company, Inc., The: *See—*
Jordan, David Paul; and Ward, Laird Gordon Lindsay, 3,814,638.
International Standard Electric Corporation: *See—*
Dobbert, Gerd, 3,814,978.
International Telephone and Telegraph Corporation: *See—*
Anhalt, John W.; and Goodman, David S., 3,815,077.
Eberhardt, Edward H., 3,814,979.
Greenwood, Roger; and Roberts, Thomas A., 3,814,132.
Oliver, Robert J.; and Turner, Earl W., 3,814,821.
Rabow, Gerald, 3,815,028.
Wallace, Charles H., 3,814,814.
Iribe, Seiki; Yamaguchi, Norihisa; and Kobayashi, Tukasa, to Teijin Limited. Method of weaving on water jet loom. 3,814,141, Cl. 139-127.000.
Irie, Namio: *See—*
Ichimura, Hiroshisa; and Irie, Namio, 3,813,964.
Iriuchijima, Makoto: *See—*
Suzuki, Hiroshi; Iriuchijima, Makoto; Nakamura, Koichi; and Yagi, Kazuharu, 3,814,724.
Irnich, Werner; and Rosenbauer, Gerhard, 1/2 interest to Irnich, Werner, Dr. Pacemaker-electrode. 3,814,104, Cl. 128-418.000.
Irnich, Werner, Dr.: *See—*
Irnich, Werner; and Rosenbauer, Gerhard, 3,814,104.
Ironside, John Michael; Hodgson, Duncan Barry; and Bertioli, Michael Murray, to Lucas, Joseph, (Electrical) Limited. Process control apparatus. 3,814,913, Cl. 235-151.100.
Isaacson, Robert B.: *See—*
Zimmerman, Daniel; and Isaacson, Robert B., 3,814,725.
Ishihara, Kazuo, to Minolta Camera Kabushiki Kaisha. Finder attachment for cameras. 3,815,149, Cl. 354-223.000.
Ishikawa, Motosuke, to Mitsubishi Jukogyo Kabushiki Kaisha. System for controlling a steam turbine at start-up. 3,813,884, Cl. 60-657.000.
Ishizawa, Kazutomo: *See—*
Taniguchi, Motoji; Kitamura, Shigeo; Ishizawa, Kazutomo; and Miyazaki, Murao, 3,813,919.
Isoliertechnik Horst Grassmann: *See—*
Rontgen, Peter, 3,814,357.
Isshiki, Setsuya; Nakayama, Shiro; and Nakayama, Kuniyuki, to Fujikura Cable Works Limited, The. Synthetic insulating paper for electric insulation. 3,814,622, Cl. 117-126.0ar.
Isuzu Motors Limited: *See—*
Kimbara, Motoyasu; and Yoshida, Yoshitaka, 3,814,068.
ITAD Alarm Systems, Inc.: *See—*
Beltrami, Joseph P., 3,815,089.
Ito, Hideo, to Pioneer Electronic Corporation. Detecting circuit for a main amplifier protecting circuit. 3,814,988, Cl. 317-31.00r.
Ito, Jinichi, to Yamada Yuki Seizo Co., Ltd. Apparatus for detecting unbalance in a wheel. 3,813,948, Cl. 73-460.000.
Ito, Tyoichi, to Hitachi, Ltd. Method of and device for modulating directly a semiconductor laser. 3,815,045, Cl. 331-94.50m.
Itoh, Yokichi; and Sunami, Hideo, to Hitachi, Ltd. Charge coupled semiconductor element with noise cancellation. 3,814,955, Cl. 307-304.000.
Ivanto, Osmo Juhani, to Spinner Osakeyhtio. Device for producing false twist on a thermoplastic filament. 3,813,867, Cl. 57-77.400.
Iwatsu, Gakuji: *See—*
Fukui, Hiroshi; Iwatsu, Gakuji; and Kato, Junichi, 3,814,410.
Ja-San, Inc.: *See—*
Barnes, Dayton W.; and Chiles, Robert D., 3,814,143.
Jacalone, Richard P.: *See—*
Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., 3,813,844.

Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., 3,814,302.

Jackes-Evans Manufacturing Company: *See—*
Harrell, Bob G.; Wenta, Peter J.; and Linsin, Russell J., 3,813,743.

Jackson, Billy G., to Lilly, Eli, and Company. Cleavage of 7-acylamido cephalosporins. 3,814,754, Cl. 260-243.00c.

Jackson Communication Corporation: *See—*
Jackson, Richard L., 3,814,383.

Jackson, Richard L., to Jackson Communication Corporation. Method of stringing aerial cable. 3,814,383, Cl. 254-134.3cl.

Jacobs, James W., to General Motors Corporation. Cantilever shelf assembly with pantography support arrangement for refrigerators. 3,814,492, Cl. 312-273.000.

Jacobsz, Roelof F., to Honeywell Inc. Programing burner control device. 3,814,569, Cl. 413-29.000.

Jacuzzi Bros. Incorporated: *See—*
Gritz, Darrell D., 3,814,543.

Jagt, Adrian Dean Vander. Apparatus for fragmenting glass. 3,814,337, Cl. 241-99.000.

Jakob, Peter, to Colortronic Reinhard & Co. KG. Dyeing process for synthetic materials. 3,814,388, Cl. 259-191.000.

Jamieson, Joseph, to Parker, Louis W. Silicon controlled rectifier motor speed controller. 3,815,001, Cl. 318-139.000.

Janko, George F., to Hoover Ball and Bearing Company. Foldable bed bottom frame assembly for use in sofa beds and the like. 3,813,710, Cl. 5-13.000.

Jankowiak, Joseph Edward. Automatic sine-cosine trigonometer. 3,814,903, Cl. 235-61.0gm.

Jannson, Birger F.; and Schmitz, Albert A., to Case, J. I., Company. Support means for rotating elements. 3,814,554, Cl. 418-73.000.

Janome Sewing Machine Co., Ltd.: *See—*
Ozaki, Yoshiaki; and Mishima, Fumiyuki, 3,814,015.

Janowak, John F.: *See—*
Ryntz, Edward F., Jr.; Janowak, John F.; and Watton, John F., 3,813,944.

Janson, Paul E.: *See—*
Cohen, John B.; Janson, Paul E.; and McFarland, Harold L., Jr., 3,815,099.

Japenga, Ronald, to Reliable Electric Company. Negative resistance repeater. 3,814,866, Cl. 179-170.00g.

Jarvenpaa, Kauko Olavi, to Suunto Oy. Device for declination correction of a magnetic compass. 3,813,792, Cl. 33-356.000.

Jawor, Tadeusz Bronislaw, to Molins Machine Company Limited. Material treating apparatus. 3,813,794, Cl. 34-136.000.

Jeco Kabushiki Kaisha: *See—*
Hirose, Masakazu, 3,813,871.

Jenkins, Thomas A.: *See—*
Iisch, Thomas A.; and Jenkins, Thomas A., 3,815,145.

Jenner-Clarke, Allan: *See—*
Dent, William Barron; and Jenner-Clarke, Allan, 3,814,541.

Jensen, Donald D. Air cleansing unit. 3,813,856, Cl. 55-444.000.

Jerry, Frederick Lonnie. Liquid absorbing device having an endless towel belt. 3,813,723, Cl. 15-119.00r.

Jetro-Matic International Corporation: *See—*
Sopcak, Edward J., 3,813,770.

Jeumont-Schneider: *See—*
Nahon, Roland Sylvain, 3,815,096.
Wiart, Albert, 3,815,003.

Johns-Manville Corporation: *See—*
Barnett, Irvin, 3,814,142.
Hibbing, Edwin Ernst; and Preisler, Frank, 3,813,977.

Johnson & Johnson: *See—*
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Priestley, Joseph A., 3,813,698.

Johnson, Bertram C.; and Steinmetz, Lloyd L., to United States of America, Atomic Energy Commission. Synchronously driven q-switched or q-switched-mode-locked laser oscillator. 3,815,046, Cl. 331-94.500.

Johnson Diversified, Inc.: *See—*
Menne, Eugene P., 3,814,349.

Johnson, George E.: *See—*
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E., 3,814,356.

Johnson, Gustave A.: *See—*
Caretto, Howard L.; Cook, Charles W.; and Johnson, Gustave A., 3,815,093.

Johnson, Harley D.: *See—*
Johnson, Richard E.; and Johnson, Harley D., 3,814,136.

Johnson, James V., to General Cable Corporation. Layer winding wire using an electric eye as a control. 3,814,348, Cl. 242-158.00r.

Johnson, James V., to United States of America, Army. Dynamic pendulum north-seeking gyro apparatus. 3,813,788, Cl. 33-321.000.

Johnson, La Vell Rolfson: *See—*
Blake, Kenneth Allen; Haden, Billy Harper; Hendershot, William Fred; and Johnson, La Vell Rolfson, 3,814,668.

Johnson, Leonard E. Door hangers. 3,813,728, Cl. 16-97.000.

Johnson, Richard E.; and Johnson, Harley D., said Johnson, Richard E., assor. to said Johnson, Harley D. Pressure sealing casting plug. 3,814,136, Cl. 138-89.000.

Johnson, Robert H.; and Phillips, Melvin C. Multi-channel combustible gas detector. 3,815,114, Cl. 340-237.00r.

Johnson Service Company: *See—*
Chacon, Manuel Frank, 3,814,987.
Thomas, Paul E.; and Colla, Jeannine O., 3,814,998.

Johnson, Stephen I.; and Thompson, Harry B., to Hastings Manufacturing Company. Low friction piston ring. 3,814,444, Cl. 277-139.000.

Johnson, Wallace E.; and Fraser, James H., to Avco Corporation. Water purification system. 3,813,892, Cl. 62-58.000.

Johnson, Walter E., Jr.: *See—*
Bledsoe, James O., Jr.; Defrer, John M.; and Johnson, Walter E., Jr., 3,814,733.

Johnston, Samuel Andrew, to Bunker Ramo Corporation. Trimmer potentiometer. 3,815,075, Cl. 338-159.000.

Johnston, William V.: *See—*
Fletcher, James C.; and Johnston, William V., 3,813,937.

Jonathan Manufacturing Company: *See—*
Alvarez, William, 3,814,877.

Jones, Calvin C., to Westinghouse Electric Corporation. Ground clutter reduction apparatus. 3,815,134, Cl. 343-17.10r.

Jones, Carloton C.: *See—*
Pittman, Allen G.; Wasley, William L.; and Jones, Carloton C., 3,814,578.

Jones, Chesley, to Illinois Tool Works, Inc. Electrical connector. 3,815,081, Cl. 339-217.00s.

Jones, Joseph W., Jr.: *See—*
Gilbert, Ronald E.; Jones, Joseph W., Jr.; and Henry, Raymond M., 3,814,737.

Jones, Michael Edward Benet, to Imperial Chemical Industries Limited. Method of preparing pile surfaced products from epoxy resin. 3,814,791, Cl. 264-164.000.

Jones, Richard B.: *See—*
Jones, Robert H., Jr.; and Jones, Richard B., 3,813,907.

Jones, Robert H., Jr.; and Jones, Richard B. Key holders. 3,813,907, Cl. 70-456.00r.

Jones, Roy: *See—*
Boyd, William D.; Dale, Dennis L. E.; and Jones, Roy, 3,814,392.

Jones, William M., to Cleveland Machine Controls, Inc. Motor control apparatus adapted for use with a motorized vehicle. 3,814,199, Cl. 180-6.500.

Jordan, David Paul; and Ward, Laird Gordon Lindsay, to International Nickel Company, Inc., The. Soldering fluxes. 3,814,638, Cl. 148-23.000.

Jordan, Joseph P.: *See—*
Price, Philip A., 3,813,746.

Jordan, Paul Vincent, to International Business Machines Corporation. Large-scale integrated circuit testing structure. 3,815,025, Cl. 324-73.00r.

Jouppi, Eino J. Blade cradle for a tree delimber. 3,814,151, Cl. 144-2.00z.

Juroyanagi, Masasi: *See—*
Masuda, Noboru; and Juroyanagi, Masasi, 3,814,956.

Kabel-und Metallwerke Gutehoffnungshitte Aktiengesellschaft: *See—*
Muller, Kurt, 3,813,910.

Kabel-und Metallwerke Gutehoffnungshuette A.G.: *See—*
Prinzhorn, Kaus; and Hein, Dieter, 3,813,765.

Kabushiki Kaisha Daini Seikosha: *See—*
Nakagawa, Yasuichi; and Sakuma, Tadashi, 3,813,872.
Nakagawa, Yasukazu, 3,813,873.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Morita, Masayuki; and Marui, Yoshitaka, 3,814,984.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Nakamura, Kenya; Kondo, Yasuo; and Kuroyanagi, Makoto, 3,814,171.

Kabushiki Kaisha Yamamoto Kogyosho: *See—*
Tajihi, Michio, 3,814,054.

Kabushikikaisha Copal: *See—*
Okabe, Katsuhiko, 3,814,230.

Kackley, William Gene, to Franklin Manufacturing Company. Snap in connector. 3,814,491, Cl. 312-257.00r.

Kadowaki, Hidejiro: *See—*
Takahashi, Toru; Kadowaki, Hidejiro; and Kuge, Tsukasa, 3,814,515.

Kadowaki, Yoshio: *See—*
Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, 3,814,778.

Kaegebein, Daniel P., to Sinclair Radio Laboratories Inc. Notch filter network. 3,815,137, Cl. 343-180.000.

Kaelin, Joseph Richard. Aeration plant for clarifying sewage and waste effluents. 3,814,395, Cl. 261-87.000.

Kahn, Friedhelm. Apparatus for melting and casting material under pressure. 3,814,170, Cl. 164-309.000.

Kaiser Glass Fiber Corporation: *See—*
Kimpel, Robert F.; and Lewis, Albert, 3,814,618.

Kaiser Steel Corporation: *See—*
Claflin, Harry B., 3,814,404.

Kaltmann, Hans-Joachim, to Reinmetall GmbH, Firma. Sighting means for firearms. 3,813,790, Cl. 33-241.000.

Kamaxhi, Hajime: *See—*
Naito, Takayuki; Okumura, Jun; and Kamaxhi, Hajime, 3,814,755.

Kamberg, Eduard F.: *See—*
Roberts, Richard J.; and Kamberg, Eduard F., 3,814,544.

Kamimura, Masaaki: *See—*
Kondo, Taizo; Inamura, Keizo; and Kamimura, Masaaki, 3,814,616.

Kamimura, Seigoro; Imai, Masaji; and Azegami, Takeo, to Ohara Iron Works Co., Ltd. Cylindrical vacuum filter. 3,814,259, Cl. 210-391.000.

Kamiya, Minoru. Method of manufacturing roll threaded screws having elasticity. 3,813,718, Cl. 10-10.00r.

Kamiya, Shigeru; Ohtsuka, Hitoshi; and Ueda, Kensaku, to Matsushita Electronics Corporation. Gas discharge tube with phosphor coating and elongate electrodes. 3,814,969, Cl. 313-486.000.

Kanagafuchi Boseki Kabushiki Kaisha: *See*—
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,814,561.

Kanbara, Isao: *See*—
Hashimoto, Juzo; Kawamoto, Hisashi; Kanbara, Isao; Inoue, Akira; and Kitajima, Akira, 3,814,815.

Kanda, Alvin F., to Sperry Rand Corporation. Gas discharge display apparatus having time multiplex operated anode and cathode driver circuits. 3,815,120, Cl. 340-336.000.

Kanefield, Bryan H.; and Ritter, Ronald, said Kanefield, Bryan H., assor. to said Ritter, Ronald. Ball game device. 3,814,425, Cl. 273-89.000.

Kanegafuchi Boseki Kabushiki Kaisha: *See*—
Taniguchi, Motoji; Kitamura, Shigeo; Ishizawa, Kazutomo; and Miyazaki, Murao, 3,813,919.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Nagoshi, Fumiya; Arakawa, Hideyuki; and Saito, Kazuo, 3,814,708.

Kaneko, Yoichi: *See*—
Takahashi, Susumu; Sato, Hitoshi; and Kaneko, Yoichi, 3,814,997.

Kansai Paint Company Limited: *See*—
Kondo, Taizo; Inamura, Keizo; and Kamimura, Masaaki, 3,814,616.

Kaplan, Murray Arthur: *See*—
Granatek, Edmund Stanley; Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,814,800.

Kareby, Erik: *See*—
Holmlund, Henrik; and Kareby, Erik, 3,814,385.

Karlovetz, Arthur Raymond, to International Magna Corporation. Radiant heater burner construction. 3,814,573, Cl. 413-329.000.

Karstedt, Bruce D., to General Electric Company. Platinum complexes of unsaturated siloxanes and platinum containing organopoly siloxanes. 3,814,730, Cl. 260-46.5ua.

Kasahara, Fumio; and Takeshita, Kazuo M4 Kimitsu Chemical Laboratory Co., Ltd., to Showa Yakuhinkako Kabushiki Kaisha. Aqueous lubricating compositions and process for the preparation thereof. 3,814,797, Cl. 424-128.000 M7 06/15/72.

Kasai, Toshiaki: *See*—
Misumi, Akira; and Kasai, Toshiaki, 3,814,966.

Kaschura, Paul, to Malich, Alfred, GmbH, Firma. Method of making shoes. 3,813,719, Cl. 12-142.0rs.

Kashima, Yoshitake: *See*—
Hori, Yasuro; Hiraishi, Kiyoto; Kiuchi, Tadashi; and Kashima, Yoshitake, 3,815,068.

Kashio, Toshio, to Casio Computer Kabushiki Kaisha. System for advancing a writing head for printer. 3,814,011, Cl. 101-93.00c.

Kasper, Andrew A., to Kendall Company, The. Monomethylol and dimethylol triazone sulfamic and acid and salts thereof. 3,814,753, Cl. 260-242.000.

Kasten, Ludwig: *See*—
Slabon, Siegfried; Kasten, Ludwig; and Ritz, Wilhelm, 3,814,475.

Kastholm, Jorgen; and Probber, Harvey. Tiltable swivel chair. 3,814,369, Cl. 148-378.000.

Kasugai, Tsuneo; Minagawa, Nobuhiko; and Sato, Masamichi, to Fuji Photo Film Co., Ltd. Process for producing the support of a photographic material. 3,814,617, Cl. 117-34.000.

Kato, Chuzo; and Kawazoe, Masashi, to Dai Nippon Printing Co., Ltd. Method of making molded composite articles having a colored pattern surface. 3,814,790, Cl. 264-122.000.

Kato, Junichi: *See*—
Fukui, Hiroshi; Iwatsu, Gakuji; and Kato, Junichi, 3,814,410.

Kato, Kotaro, to Nippon Electric Company, Limited. Demodulator for phase-modulated carrier waves. 3,815,034, Cl. 329-104.000.

Kaufman, Rudolph: *See*—
Thouret, Wolfgang E.; and Kaufman, Rudolph, 3,814,973.

Kawamoto, Hisashi: *See*—
Hashimoto, Juzo; Kawamoto, Hisashi; Kanbara, Isao; Inoue, Akira; and Kitajima, Akira, 3,814,815.

Kawamura, Takeshi: *See*—
Arima, Kei; Kawamura, Takeshi; Tamura, Gakuzo; and Beppu, Teruhiko, 3,814,795.

Kawasumi, Shohachi; Hirooka, Masaaki; and Yabuuchi, Hiroshi, to Sumitomo Chemical Company, Limited. Multicomponent interpolymers having alternating sequential structure. 3,814,734, Cl. 260-63.00r.

Kawaziri, Kazuhiro: *See*—
Kitamoto, Tasuji; Aonuma, Masashi; and Kawaziri, Kazuhiro, 3,814,672.

Kawazoe, Masashi: *See*—
Kato, Chuzo; and Kawazoe, Masashi, 3,814,790.

Kebles, Michael K.: *See*—
Verdone, Joseph A.; and Kebles, Michael K., 3,814,696.

Keene Corporation: *See*—
Rood, William R., 3,814,488.

Keilman, Michael R., to Baxter Laboratories, Inc. Dispensing container. 3,814,236, Cl. 206-72.000.

Kelly, Edward A., Jr.: *See*—
Hunter, James R.; Lazzarotti, S. James; and Kelly, Edward A., Jr., 3,814,415.

Kelly, James J. Anti-theft bicycle frame. 3,814,462, Cl. 280-287.000.

Kempermann, Theo: *See*—
Hartmann, Peter; Redetzky, Wolfgang; Roos, Ernst; and Kempermann, Theo, 3,814,727.

Kendall Company, The: *See*—
Kasper, Andrew A., 3,814,753.

Kennard, Jack Frederick: *See*—
Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, 3,814,990.

Kennedy, Andrew J., to United States of America, Army. Tuneable infrared photocathode. 3,814,993, Cl. 357-30.000.

Kensai Paint Co., Ltd.: *See*—
Nakayama, Hiroyuki; and Asasa, Kiyohiko, 3,814,703.

Kent, Brean Ernest: *See*—
Wilson, Alan Donald; and Kent, Brean Ernest, 3,814,717.

Kercheval, Frank T. Boat leveler tab. 3,814,044, Cl. 114-66.50p.

Kerr, Bruce Goring, to Goring Kerr Limited. Two threshold level detector using a capacitive or inductive probe for sorting. 3,815,021, Cl. 324-61.00r.

Kerr, Robert M. Implement for manipulation of snap rings. 3,813,750, Cl. 29-229.000.

Kerr, William J., to Chicago Lock Co. Axial split-pin tumbler-type lock. 3,813,906, Cl. 70-363.000.

Kessler, Hans-Joachim: *See*—
Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, 3,814,758.

Kessler, William D.: *See*—
Finlay, Alexander, Jr.; Dyer, Robert E.; and Kessler, William D., 3,815,119.

Kevex Corporation: *See*—
Lowes, Albert Robert, 3,814,937.

Keystone Industries, Inc.: *See*—
Hawthorne, Vaugn T., 3,814,266.

Kicher, Thomas P.; and Nattrass, Lawrence A., to Case Western Reserve University. Impact absorber. 3,814,470, Cl. 293-70.000.

Kidde, Walter, & Company, Inc.: *See*—
Hansen, Arne, 3,814,298.

Kieninger & Obergfell, Fabrik fur technische Laufwerke und Apparate: *See*—
Fehrenbacher, Wolfgang, 3,813,952.

Kigler, Edward. High frequency antenna. 3,815,141, Cl. 343-795.000.

Killmeyer, Charles W.: *See*—
McWilliams, Donald E.; Killmeyer, Charles W.; and Eilerman, George E., 3,814,592.

Kim, Dong H.: *See*—
Santilli, Arthur A., 3,814,762.

Kimbara, Motoyasu; and Yoshida, Yoshitaka, to Isuzu Motors Limited. Combustion chamber for an internal combustion engine of direct injection type. 3,814,068, Cl. 123-32.00a.

Kimpel, Robert F.; and Lewis, Albert, to Kaiser Glass Fiber Corporation. Production of colored coated glass fibers. 3,814,618, Cl. 117-61.000.

Kimura, Mamoru: *See*—
Shimizu, Katsumi; and Kimura, Mamoru, 3,814,406.

Kimura, Takehiko; Niizawa, Yoshiki; and Hirano, Reiji, to Canon Kabushiki Kaisha. Zero suppressor circuit. 3,815,098, Cl. 340-172.500.

Kinard, William C., to Relton Corporation. Tennis racket display rack. 3,814,263, Cl. 211-13.000.

Kincs, Frank R.: *See*—
Henthorn, Larry J.; and Kincs, Frank R., 3,814,822.

King Instrument Corporation: *See*—
King, James L., 3,814,652.

King, James L., to King Instrument Corporation. Tape splicing method and machine. 3,814,652, Cl. 156-159.000.

King of All, Inc., The: *See*—
Larsen, Ernest F., 3,813,737.

King Radio Corporation: *See*—
Lehfeldt, James J., 3,814,911.

King, Robert W., to Avco Corporation. Method of and apparatus for making hollow 3-D material. 3,813,739, Cl. 28-1.00r.

King-Seeley Thermos Co.: *See*—
Bell, Vernon D., 3,813,757.

Kipfer, Fritz. Bedstead with slats of different stiffness. 3,813,713, Cl. 5-238.000.

Kirby, Charles A.; and Munger, Warren B., to Northwest Design Products, Inc. Playground climbing structures. 3,814,416, Cl. 272-56.50r.

Kirk, Irvin: *See*—
Cometto, Dante James; Morse, Jeremy Painter; Crickmer, Robert Edward; and Kirk, Irvin, 3,814,635.

Kirk, Robert T., to Eaton Corporation. Remote device control communication system. 3,815,091, Cl. 340-147.00r.

Kirner, Ernest O., to Bendix Corporation, The. Recirculating delay line decoder-encoder. 3,815,031, Cl. 328-56.000.

Kishel, Joseph F.: *See*—
Tanguy, Denis R.; and Kishel, Joseph F., 3,813,935.

Kishel, Joseph F., to Weston Instruments, Inc. Apparatus for detecting the entry of formation gas into a well bore. 3,814,183, Cl. 166-226.000.

Kishikawa, Kanichi: *See*—
Matsufuji, Akira; Kishikawa, Kanichi; Sasaki, Yasuto; Miyaji, Susumu; and Tutui, Fumihiro, 3,813,912.

Kissel, William R., to Chrysler Corporation. Photo-optical transducer. 3,814,935, Cl. 250-231.00r.

Kitajima, Akira: *See*—
Hashimoto, Juzo; Kawamoto, Hisashi; Kanbara, Isao; Inoue, Akira; and Kitajima, Akira, 3,814,815.
Kitamoto, Tasuji; Aonuma, Masashi; and Kawaziri, Kazuhiro, to Fuji Photo Film Co., Ltd. Process for reproducing magnetization pattern by plating. 3,814,672, Cl. 204-12.000.
Kitamura, Shigeo: *See*—
Taniguchi, Motoji; Kitamura, Shigeo; Ishizawa, Kazutomo; and Miyazaki, Murao, 3,813,919.
Kitazawa, Takeo: *See*—
Inoue, Kozo; Hara, Toshito; Kitazawa, Takeo; Yamamoto, Kazuyoshi; and Oguma, Toshiro, 3,814,612.
Kitrilakis, Sotiris; and Robinson, Thomas C., to Tecna Corporation. Nontraumatic heart pump. 3,814,547, Cl. 417-383.000.
Kiuchi, Tadashi: *See*—
Hori, Yasuro; Hiraishi, Kiyoto; Kiuchi, Tadashi; and Kashima, Yoshitake, 3,815,068.
Klager, Karl; and Dekker, Albert O., to Aerojet-General Corporation and Non-toxic gas generation. . 3,814,694, Cl. 252-186.000.
KLAXON: *See*—
Warnod, Bertrand Antoine, 3,814,050.
Kleber, David. Intrusion alarm. 3,815,112, Cl. 340-214.000.
Klee, David J.; and Sills, John T., to Air Products and Chemicals, Inc. Food freezing apparatus. 3,813,895, Cl. 62-266.000.
Klee, Gerhard, to Samson Apparatebau AG. Fluid conducting system. 3,814,126, Cl. 137-608.000.
Klein, James A.: *See*—
Manke, Girard M.; Schuldt, Theodore J., Jr.; and Klein, James A., 3,814,912.
Klein, Roy W.: *See*—
Adamowicz, Norman C.; Klein, Roy W.; and Tremmel, Robert A., 3,814,674.
Kleindienst, Horst; Roos, Gerold; and Zingg, Rudolf, to Zellweger Ltd. Measuring heads for strength testers. 3,813,930, Cl. 73-95.500.
Klemp, Eldon John; and Cassibo, Vernon Edward, to Litton Systems Inc. Microwave oven having a magnetron extending directly into the oven cavity. 3,814,890, Cl. 219-10.550.
Klimas, George C.: *See*—
Weber, John L.; and Klimas, George C., 3,813,825.
Klitzke, Loren J.: *See*—
Dick, Raymind S.; and Klitzke, Loren J., 3,814,650.
Klompas, Nicholas, to General Electric Company. Rotor sealing arrangement for an axial flow turbine. 3,814,539, Cl. 416-95.000.
Klumb, Ralph H.; and Hutchinson, John J., to Combustion Engineering, Inc. Fuel assembly hold-down device. 3,814,667, Cl. 176-87.000.
Knell, Bernhard; and Bruderer, Werner, to Concast AG. Dummy bar handling system. 3,814,169, Cl. 164-274.000.
Kniepkamp, Hermann, to Siemens Aktiengesellschaft. Method of producing schottky contacts. 3,813,762, Cl. 29-589.000.
Knotex Maschinenbau G.m.b.H.: *See*—
Powell, Charles W., 3,813,813.
Knuth, Everett F. Electricians wire stripping tool. 3,813,966, Cl. 81-9.50b.
Kobayashi, Sadao; Tazawa, Eiichi; Matsunaga, Mitsuro; Hoshino, Chikafusa; and Kunisaki, Hideo, to Mitsui Toatsu Chemicals, Inc. Process for the manufacture of structural materials. 3,814,619, Cl. 177-62.000.
Kobayashi, Tadashi: *See*—
Yamada, Kiyoshi; Kobayashi, Tadashi; and Morisue, Kazuschige, 3,814,833.
Kobayashi, Tukasa: *See*—
Iribe, Seiki; Yamaguchi, Norihisa; and Kobayashi, Tukasa, 3,814,141.
Kobler, Paul. Tampons. 3,814,099, Cl. 128-285.000.
Kobota, Eishi: *See*—
Honda, Toshio; Kobota, Eishi; Tanaka, Shoji; and Fukuura, Yokio, 3,814,713.
Kochring Company: *See*—
Carnahan, John T.; and Briggs, Eugene C., 3,814,531.
Ebersole, D. Henry, 3,813,950.
Koh, Chew Seng. Chokes or reactors. 3,815,067, Cl. 336-83.000.
Kohlhage, Hermann, to Triumph Werke Nurnberg A.G. Data output printer. 3,814,229, Cl. 197-18.000.
Koivunen, Erkki A., to General Motors Corporation. Differential and brake assembly with parking brake for differential outputs. 3,814,222, Cl. 192-4.00a.
Kojima, Katue: *See*—
Maruyama, Shoji; Kojima, Katue; Kubota, Tomio; and Ohta, Masafumi, 3,814,752.
Kokado, Naoyuki, to Tokyo Shibaura Electric Co., Ltd. Synchronizing signal producing system for a television device. 3,814,855, Cl. 178-69.5tv.
Kokoras, John N.; and Kokoras, William N. Hide treating machines. 3,813,819, Cl. 51-39.000.
Kokoras, William N.: *See*—
Kokoras, John N.; and Kokoras, William N., 3,813,819.
Kokumai, Akihisa: *See*—
Hirowatari, Tomoyuki; Kurihara, Tomomichi; Kokumai, Akihisa; Hori, Toru; and Tanimoto, Takaaki, 3,814,042.
Kolan, Andrew, to Martin Mariette Corporation. Calculating device. 3,814,308, Cl. 235-70.000.
Kondo, Taizo; Inamura, Keizo; and Kamimura, Masaaki, to Kansai Paint Company Limited. Method for coating the inner surface of metal pipes. 3,814,616, Cl. 117-17.000.
Kondo, Yasuo: *See*—
Nakamura, Kenya; Kondo, Yasuo; and Kuroyanagi, Makoto, 3,814,171.
Konishiroku Photo Industry Co., Ltd.: *See*—
Abe, Toshio, 3,814,523.
Koob, Werner: *See*—
Nix, Hans; and Koob, Werner, 3,815,016.
Korbanka, Helmut: *See*—
Feiler, Leander; and Korbanka, Helmut, 3,814,738.
Kormos, Kalman; and Szilagyi, Dezso, to General Signal Corporation. Adjustable body seat for butterfly valves. 3,814,380, Cl. 251-307.000.
Korzenowski, James P.: *See*—
Lumby, Donovan H.; Buerman, James T.; and Korzenowski, James P., 3,814,007.
Kosugi, Junichi: *See*—
Araki, Tadashi; Asano, Kiro; Kosugi, Junichi; and Tamura, Fumio, 3,814,642.
Kowalewski, John J., to Consolidated Foods Corporation. Vacuum cleaner suction tool with pile agitator rotatable in a horizontal plane for cleaning deep pile shag rugs. 3,813,726, Cl. 15-385.000.
Kowalski, Edward W.; and Plesich, Marion F., to Zavaglia, Edmund A. and Union Barbide Corporation. Latex polymers. 3,814,716, Cl. 260-29.60t.
Kowatch, Edward J. Non-pneumatic vehicle wheel. 3,814,157, Cl. 152-17.000.
Kozak, Theordore Fredrick, to Union Carbide Corporation. Disposable absorbent articles. 3,814,101, Cl. 128-287.000.
Kraemer, Stefan; Seger, Michael; and Seidl, Alois, to Wasag Chemie GmbH. Lightweight structural concrete. 3,814,614, Cl. 106-97.000.
Kraft, Sidney; and Preston, Francis R., to United States of America, Air Force. Radar altimeters for automatic landing systems. 3,815,026, Cl. 324-103.00p.
Kralik, Andrew J.: *See*—
Di Marco, Bernard; Swain, Kenneth W.; and Kralik, Andrew J., 3,815,072.
Kramer, Anthony J.: *See*—
Parker, Jeffrey M.; Dawson, Edward C.; and Kramer, Anthony J., 3,815,032.
Kramer, Norman: *See*—
Barlow, Gordon A.; and Kramer, Norman, 3,813,812.
Kropelnicki, Matt. Fishing reel with coaxial drag and mounting assemblies. 3,814,345, Cl. 242-106.000.
Krout, Leo Martin. Ship salvage apparatus. 3,814,043, Cl. 114-54.000.
Kruger, Fred B.: *See*—
Mulholland, Terence H.; and Kruger, Fred B., 3,814,321.
Kruger, Jean J.; and Rossitto, Vincent E., said Kruger assor. to Rossitto, Vincent E. Method and apparatus for removing liquid contaminants from a submerged tank. 3,813,887, Cl. 61-69.00r.
Kruszewski, William Frank, to GTE Sylvania Incorporated. Gated AFC circuit. 3,814,843, Cl. 178-5.8af.
Krysiak, Joseph E. Air generating mechanism for an aircraft air cushion takeoff and landing system. 3,814,206, Cl. 180-116.000.
Kubota, Tomio: *See*—
Maruyama, Shoji; Kojima, Katue; Kubota, Tomio; and Ohta, Masafumi, 3,814,752.
Kubotera, Kikuo: *See*—
Mukaida, Yoshito; Kubotera, Kikuo; and Mizuki, Eiichc, 3,814,603.
Kuck, Kermit T.; and Gushing, Nagle V., to Monarch Machine Tool Company, The. Dual turret lathe. 3,813,745, Cl. 29-36.000.
Kudler, Harvey. Cleansing composition. 3,814,693, Cl. 252-111.000.
Kuge, Tsukasa: *See*—
Takahashi, Toru; Kadowaki, Hidejiro; and Kuge, Tsukasa, 3,814,515.
Kugel, Walter, to Bahmuller, Wilhelm. Method of connect cardboard, Paper or the like. 3,814,654, Cl. 156-290.000.
Kugler, Fritz: *See*—
Hugelshofer, Paul; and Kugler, Fritz, 3,814,726.
Kuhnle, Paul, to Hesser, Fr., Maschinenfabrik AG. Container filling and producing machine. 3,813,847, Cl. 53-112.00b.
Kuma, Shoji: *See*—
Tanaka, Eihachiro; Onodera, Yutaka; Fukuda, Takeji; Yamashita, Tsutomu; and Kuma, Shoji, 3,813,764.
Kumakura, Itsuo: *See*—
Nishi, Koji; Kumakura, Itsuo; and Hamaguchi, Ukio, 3,813,806.
Kump, Herbert J.; Lambert, Lloyd M., Jr.; and Quinn, Robert M., to International Business Machines Corporation. High performance fet. 3,814,992, Cl. 357-23.000.
Kumpfbeck, Richard J.; and Vitolo, Aristide J., to Sheldon Aircraft Products Corporation. Vehicle alarm circuit responsive to selected battery voltage transients. 3,815,088, Cl. 340-63.000.
Kunisaki, Hideo: *See*—
Kobayashi, Sadao; Tazawa, Eiichi; Matsunaga, Mitsuro; Hoshino, Chikafusa; and Kunisaki, Hideo, 3,814,619.
Kunststoffwerk Gerbrueder Anger GmbH & Co.: *See*—
Streng, Erwin; and Schurian, Arnold, 3,814,564.
Kupchinski, Edward C. Massaging device. 3,814,085, Cl. 128-57.000.
Kupetis, Raymond F.: *See*—
Weston, Donald E.; and Kupetis, Raymond F., 3,814,878.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Araki, Tadashi; Asano, Kiro; Kosugi, Junichi; and Tamura, Fumio, 3,814,642.
Kurihara, Tomomichi: *See*—

Hirowatari, Tomoyuki; Kurihara, Tomomichi; Kokumai, Akihisa; Hori, Toru; and Tanimoto, Takaaki, 3,814,042.
Kuroda, Toyoaki; and Shimizu, Toyokazu, to Parke, Davis & Company. Inspection apparatus and means. 3,814,931, Cl. 250-223.00p.
Kuroda, Yozi: *See—*
Arakawa, Tamio; and Kuroda, Yozi, 3,814,792.
Kuroyanagi, Makoto: *See—*
Nakamura, Kenya; Kondo, Yasuo; and Kuroyanagi, Makoto, 3,814,171.
Kuss, R. L.,& Co., Inc.: *See—*
Kuss, Ralph L., 3,814,164.
Kuss, Ralph L., to Kuss, R. L.,& Co., Inc. Flexible door assemblage. 3,814,164, Cl. 160-120.000.
Kusuda, Takazo; and Nishiwaki, Niichi, to Osaka Gas Kabushiki Kaisha. Apparatus for detecting leak of fluid from a long pipeline for transporting fluid. 3,814,207, Cl. 181-.51d.
Kuwabara, Masahiro: *See—*
Takahashi, Akira; and Kuwabara, Masahiro, 3,813,821.
Kyte, Derek John. Photographic type face reproducers. 3,814,848, Cl. 178-7.100.
La Croce, Leonard Thomas; and Radtke, Charles Stephan, to American Can Company. Reclosable can. 3,814,277, Cl. 220-42.00c.
La Patta, Robert A.: *See—*
Zankowsky, Matthew S.; and La Patta, Robert A., 3,814,076.
Labaune, Camille: *See—*
Lombard, Claude Edmond; Labaune, Camille; and Neubauer, Pierre, 3,815,010.
Labbe, Francis A. M.; Preston, Edward G.; Hodsall, Brian; and Marritt, Clifford R. Continuous filter rod making machines. 3,813,996, Cl. 93-1.00c.
Laboratoire d'Electronique et d'Automatique Dauphinois, L.E.A.D.: *See—*
Mayer, Ferdy, 3,815,020.
Laboratories J. Berthier S.A.: *See—*
Eymard, Pierre Luc Georges, 3,814,812.
Laing, Ingeborg; and Laing, Nikolaus. Variable insulation means utilizing convection generators. 3,814,175, Cl. 165-96.000.
Laing, Nikolaus: *See—*
Laing, Ingeborg; and Laing, Nikolaus, 3,814,175.
Laing, Nikolaus. Stator for rotating electrical machines. 3,814,963, Cl. 310-217.000.
Laliberte, Albert J.: *See—*
DeAngelis, Armand; and Laliberte, Albert J., 3,814,094.
Lam, Charles T. W.: *See—*
Fraser, Joseph Wilfred, Jr.; Lam, Charles T. W.; and Mast, Raymond L., 3,814,586.
Lambert, Lloyd M., Jr.: *See—*
Kump, Herbert J.; Lambert, Lloyd M., Jr.; and Quinn, Robert M., 3,814,992.
Land O'Lake, Inc.: *See—*
Lumby, Donovan H.; Buerman, James T.; and Korzenowski, James P., 3,814,007.
Langer, Arthur W., Jr.: *See—*
Tornquist, Erik; and Langer, Arthur W., Jr., 3,814,743.
Lanpheer, Richard A.: *See—*
Reid, Raymond R.; and Lanpheer, Richard A., 3,813,880.
Lardeau, Jacques, to Societe d'Optique Presision Electronique et Mecanique-SOPELEM. Variable-field mixer for television transmissions. 3,814,853, Cl. 178-7.850.
Larkin, Robert F., to Ecolotec Inc. Dual steering for tilt-cab vehicle. 3,814,204, Cl. 180-89.000.
Larkin, Terrance M., to Gates Rubber Company, The. Battery paste pumping and metering system. 3,814,628, Cl. 117-201.000.
Larsen, Ernest F., to King of All, Inc., The. Clasp for bola tie with interchangeable mount. 3,813,737, Cl. 24-495.000.
Larsen, Otis M. Vernier attachment. 3,813,785, Cl. 33-169.00b.
Larson, Roger L.: *See—*
Barrett, John C.; and Larson, Roger L., 3,814,532.
Larson, Timothy William. Tent stake guard. 3,814,118, Cl. 135-15.0pe.
Latos, Edwin J., to Universal Oil Products Company. Working of nonferrous metals. 3,814,212, Cl. 184-1.00c.
Laundrie, James F., to United States of America, Agriculture. Separation of thermoplastic film and wastepaper. 3,814,240, Cl. 209-11.000.
Lawes, Michael John Anthony. Loose leaf binders. 3,814,527, Cl. 402-3.000.
Lawhead, Creighton M., to Corning Glass Works. Method and apparatus for fluid collection and/or partitioning. 3,814,248, Cl. 210-83.000.
Lawless, William N.; and Wedding, Brent M., to Corning Glass Works. Cryogenic capacitive bolometer. 3,814,999, Cl. 317-247.000.
Lawrence, Walter F.: *See—*
Freedman, Norman S.; Horsting, Carle W.; Lawrence, Walter F.; and Carrona, John J., 3,814,633.
Lawrence, Willis Thompson; and Spaulding, David B., to Amron Research and Development Corporation. Embossed card reader. 3,814,905, Cl. 235-61.11c.
Lawson, Thomas Gordon, to Girling Limited. Fluid control valves. 3,814,121, Cl. 137-329.030.
Lazzarotti, S. James: *See—*
Hunter, James R.; Lazzarotti, S. James; and Kelly, Edward A., Jr., 3,814,415.
Le Roy, Raymond F., Sr., to Upjohn Company, The. Liquid collecting and filtering device. 3,814,079, Cl. 128-2.00f.
Le Trung, Truc: *See—*
Cahour, Maurice Alphonse Jules; Le Trung, Truc; and Signoret, Lucien Gaston, 3,814,565.
Lea, Hans: *See—*
Ahrens, Wilhelm; Lea, Hans; Rohm, Fritz; and Straehle, Heinz, 3,814,387.
Leach, Jack; Zoufaly, Jerome; and Fash, William G., to Burlington Industries, Inc. Bomb suppression device. 3,814,016, Cl. 102-22.000.
Lebahn, Arthur C., to Vollrath Co., The. Freezer air vent. 3,813,896, Cl. 62-409.000.
Leclercq, Ignace, to Societe de Fabrication d'Instruments de Mesure SFIM. Crossroads controller. 3,815,085, Cl. 340-41.00r.
Lederle, Henry F.: *See—*
Csejka, David A.; and Lederle, Henry F., 3,814,691.
Ledges, George E.: *See—*
Wolfe, John E.; Ledges, George E.; and Glascock, Homer H., 3,814,975.
Lee, Raymond, Organization, Inc., The: *See—*
Stratton, Willis T., 3,814,435.
Legille, Edouard, to S.A. Des Anciens Etablissements Paul Wurth. Drive for furnace charge distribution apparatus. 3,814,403, Cl. 266-27.000.
Lehfeldt, James J., to King Radio Corporation. Method and apparatus for intercepting a radio defined course. 3,814,911, Cl. 235-150.260.
Lehuen, Christian; and Gillet, Roger, to Societe Generale De Constructions Electriques et. Cooling arrangement for rotary electric machines. 3,814,959, Cl. 310-55.000.
Lehureau, Jean: *See—*
Bourdon, Louis; Simon, Etienne; Borrel, Philippe; and Lehureau, Jean, 3,814,702.
Leich, Rolf: *See—*
Stambera, Adolf; and Leich, Rolf, 3,813,849.
Leighton, Joseph C.: *See—*
Bower, Arnold B., Jr.; and Leighton, Joseph C., 3,814,482.
Leitz, Ernst G.m.b.H.: *See—*
Heitmann, Knut, 3,814,958.
Lemanski, Savarian F. Quick change tool holder. 3,813,971, Cl. 82-36.00r.
Lemb, John, to Ille Electric Corporation. Hydrotherapy agitator with provision for rapid disassembly and reassembly. 3,814,086, Cl. 128-66.000.
Lemons, Carl Robert, to Mc Donnell Douglas Corporation. Cryogenic storage vessel. 3,814,275, Cl. 220-9.01c.
Leopold, Wilbur R., Jr., to Mueller Co. Service head adapter. 3,814,466, Cl. 285-55.000.
Leumi, Dubi A. 50% to Gay, Andrew G. Ball game player with mallets. 3,814,430, Cl. 273-118.00r.
Lever Brothers Company: *See—*
Gilbert, Paul, 3,814,195.
Levine, Harvey, to Struhl, Morris, Inc. Steam mist apparatus for hot combs and hair dryers. 3,814,898, Cl. 219-362.000.
Lewenstein, Mozes J.; deceased: *See—*
Fishman, Jack (Lewenstein, Evalina; executrix of the estate of), 3,814,768.
Lewin, Ronald Harvey; and Hayman, Cecil, to Fulmer Research Institute Limited. Formation of tungsten and molybdenum carbides. 3,814,625, Cl. 117-71.00m.
Lewis, Albert: *See—*
Kimpel, Robert F.; and Lewis, Albert, 3,814,618.
Lewis, Beverley W.: *See—*
United STates of America, National Aeronautics and Space Administration, 3,813,875.
Lewis, Jay L.: *See—*
Puster, Louis M.; Lewis, Jay L.; and Brakebill, Harold G., 3,814,311.
Lewis, Robert F.; and Nelson, James W., to Prodelin, Inc. Feed horns for reflector dishes. 3,815,139, Cl. 343-775.000.
Lewison, Lawrence. Contact lens and apparatus for producing same. 3,814,051, Cl. 118-49.000.
Lexitron Corporation: *See—*
Goldman, Arnold J., 3,815,104.
Ley, Kurt: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,814,756.
Leynaert, Jacky R.; and Mechin, Bernard J., to Office Nationale d'Etude et de Recherches Aerospatiales. Jet propulsion engines for supersonic aircraft or vehicles. 3,814,323, Cl. 239-265.170.
Lichti, Robert W.: *See—*
Blood, Ernest R.; Lichti, Robert W.; and Pierson, James A., 3,814,269.
Lienhard, Julius Caesar. Moving pivoted indicating target. 3,814,429, Cl. 273-102.10e.
Lilly, Eli, and Company: *See—*
Jackson, Billy G., 3,814,754.
Lincoln Manufacturing Company, Inc.: *See—*
Morhack, George J., 3,814,901.
Lindberg, Arne Robert. Determining and following a sedimentation level by optical measurement. 3,814,930, Cl. 250-201.000.
Lindberg, Thyge L. Fluid filling system. 3,814,147, Cl. 141-94.000.
Lindemann, Wolfgang, to Orbit Beratungsgesellschaft GmbH. Preturning machine for wire or rod stock. 3,813,748, Cl. 29-105.00r.
Lindley, William L. Arrangement for tubeless tire. 3,814,159, Cl. 152-158.000.

Linsin, Russell J.: *See—*
Harrell, Bob G.; Wenta, Peter J.; and Linsin, Russell J., 3,813,743.
List, Harold A.; and Baker, Jack H., to Bethlehem Steel Corporation. Automatic dry coke weight system. 3,814,914, Cl. 235-151.100.
Listhuber, Friedrich; Fastner, Thorwald; and Bachner, Ernst, to Vereinigte Osterreichische Eisen- und Stahlwerke-Aktiengesellschaft. Process for separating non-metallic inclusions from hot liquid metal. 3,814,167, Cl. 164-82.000.
Little, Arthur D., Inc.: *See—*
Gabron, Frank; and McCullough, John E., 3,814,361.
Littmann, Walter Fritz Konrad: *See—*
Hansen, Norbert Ernst Fritz; and Littmann, Walter Fritz Konrad, 3,814,629.
Litton Systems Inc.: *See—*
Klemp, Eldon John; and Cassibo, Vernon Edward, 3,814,890.
Liu, Chelcie B.: *See—*
Phillips, David T.; Brooks, Herman H.; Wyatt, Philip J.; and Liu, Chelcie B., 3,815,000.
Livera, Phillip A., to Westinghouse Electric Corporation. Method and apparatus for the rocking compaction of refractory metal powders. 3,814,788, Cl. 264-111.000.
Lo, Allen Kwok Wah: *See—*
Nims, Jerry Curtis; and Lo, Allen Kwok Wah, 3,814,513.
Lochmann, Heinz. Actuating mechanism for disk brake. 3,814,217, Cl. 188-72.800.
Locricchio, Joseph J., to Indusco Corporation. Structural network for making composite concrete tiers. 3,814,371, Cl. 249-14.000.
Loctite Corporation: *See—*
Bachmann, Andrew; and Batson, Robert E., 3,814,156.
Lohr, Joachim, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Air compressing internal combustion engine with direct injection. 3,814,066, Cl. 123-32.00r.
Lombard, Claude Edmond; Labaune, Camille; and Neubauer, Pierre, to Regie Nationale des Usines Renault and Automobiles Peugeot. Electronic control devices called governors-comparators for vehicle automatic gear boxes. 3,815,010, Cl. 322-28.000.
Longuet, Maurice, to Thomson-CSF. Television signal processing device. 3,814,847, Cl. 178-7.100.
Lonzo Ltd.: *See—*
Boosen, Karl-Josef, 3,814,763.
Loock, Willi. Loading, unloading and transporting device. 3,814,271, Cl. 214-509.000.
Loomis, Harry J., 1/2 to Body, Alfred C. Method and apparatus for making snow. 3,814,319, Cl. 239-2.00s.
Lorain Products Corporation: *See—*
Chambers, Charles W., Jr., 3,815,041.
L'Oreal: *See—*
Morane, Bruno P.; and Vien, Andre, 3,814,113.
Lorenz, Hellmut, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Friction false-twisting device. 3,813,868, Cl. 57-77.400.
Lorenzen, George Fred, Jr. Protective inner liner for truck bodies. 3,814,473, Cl. 296-39.00r.
Lotfallah, Lotfi H., to Gillette Company, The. Sabotage-proof marking instruments and elements therefor. 3,814,526, Cl. 401-199.000.
Lotto, Ronald L., to FMC Corporation. Apparatus for making bottom seal thermoplastic bags. 3,813,998, Cl. 93-3.00h.
Love, J. E., Company: *See—*
Fuller, Harry S.; and Partch, Ambrose H., 3,813,859.
Love, John J.: *See—*
Burket, Richard A.; Fleer, Thomas P.; Smith, Carl A.; and Love, John J., 3,814,634.
Lovelace, Joseph B.: *See—*
Nalley, Charles E.; and Lovelace, Joseph B., 3,814,715.
Lowes, Albert Robert, to Kevex Corporation. Pulse pile-up rejector with live-time corrector circuit. 3,814,937, Cl. 250-336.000.
Loyd, Patrick V.; and Mills, Samuel M., to Stone Industrial Corporation. Insulating connector. 3,814,139, Cl. 138-141.000.
LTV Aerospace Corporation: *See—*
Nelson, Roy A., 3,814,025.
Lubarsky, Andra, Jr.; and Pospisil, Richard E., to Telecommunications Technology, Inc. Remote digital switching technique for use on communication circuits. 3,814,839, Cl. 178-2.00c.
Lubarsky, Andre, Jr.; and Warner, G. Scott, to Telecommunications Technology, Inc. Remote digital switching technique for use on communication circuits. 3,814,840, Cl. 178-2.00c.
Lubens, Herman Michael. Occlusively applied anesthetic patch. 3,814,095, Cl. 128-260.000.
Lubsen, Timothy Andrew; Patel Jayantilal Mohanbhai; and Cody, Robert Autand, to Procter & Gamble Company. Process for improving the aroma retention of freeze-dried coffee products. 3,814,826, Cl. 426-388.000.
Lucas, Joseph, (Electrical) Limited: *See—*
Ironside, John Michael; Hodgson, Duncan Barry; and Bertioli, Michael Murray, 3,814,913.
Lucas, Joseph, (Industries) Limited: *See—*
Croft, Brian Hugh; and Browne, Denis Anthony, 3,814,069.
Nathanson, Harvey C.; Thomas, Richard N.; and Guldberg, Jens, 3,814,968.
Lukas-Beddy S.p.A.: *See—*
Fiaschi, Gastone, 3,813,711.
Lumby, Donovan H.; Buerman, James T.; and Korzenowski, James P., to Land O'Lake, Inc. Injecting apparatus. 3,814,007, Cl. 99-532.000.
Lunden, Clarence D.: *See—*
Buehler, Walter E.; and Lunden, Clarence D., 3,815,140.
Luxaire, Inc.: *See—*
Brockhurst, Woodrow W., 3,814,576.
Lynn, Dale Everett, to Bell Telephone Laboratories, Incorporated. Dual mode video clamping circuit. 3,814,952, Cl. 307-237.000.
M & T Chemicals Inc.: *See—*
Van Gordon, Donald V.; and McNally, Peter J., 3,814,276.
Macano, Samuel J.: *See—*
Matthews, William J.; and Macano, Samuel J., 3,814,484.
Machine Tool Divisional Services Limited: *See—*
Hodgson, Brian, 3,813,988.
Mack-Wayne Plastics Company: *See—*
Mc Intosh, James A., 3,814,274.
MacKenzie, Donald Reeve, to Bell Telephone Laboratories, Incorporated. Adjustable mirror mount. 3,814,365, Cl. 248-278.000.
Maehans, Vaino, to Alfa-Laval AB. Apparatus for removing teat cups. 3,814,056, Cl. 119-14.080.
Maeno, Takeshi: *See—*
Shiragai, Yasuo; and Maeno, Takeshi, 3,814,494.
Magerman, Leonard S., to Polaroid Corporation. Remote control system for photographic apparatus. 3,814,872, Cl. 200-33.00r.
Magnavox Company, The: *See—*
Mierzwinski, Eugene P., 3,814,852.
Van Antwerp, Robert L., 3,814,442.
Maier, Alfred E.; and Stephenson, William I., Jr., to Westinghouse Electric Corporation. Circuit interrupter protective device. 3,815,064, Cl. 335-176.000.
Maillefer, Charles, to Maillefers SA. Control device for the transfer operation of a double coil-winder. 3,814,340, Cl. 242-25.0aj.
Maillefers SA: *See—*
Maillefer, Charles, 3,814,340.
Majewski, Eugene J. Coordination top. 3,813,810, Cl. 46-64.000.
Makaida, Yoshito: *See—*
Shinozaki, Fumiaki; Ikeda, Tomoaki; Makaida, Yoshito; and Tsuboi, Masayoshi, 3,814,602.
Maker, David L.; Peng, Stephen C.; and Vos, Arend W. D., to Ford Motor Company. Process for preparing non-aqueous dispersion of thermosetting film forming copolymer. 3,814,720, Cl. 260-33.40r.
Maker, David L., to Peng, Stephen C. and Ford Motor Company. Nonaqueous dispersions of thermosetting film forming copolymers of ethenic monomers. 3,814,721, Cl. 260-33.60r.
Malaviya, Shashi D., to International Business Machines Corporation. Master-slave binary divider circuit. 3,814,953, Cl. 307-289.000.
Malich, Alfred, GmbH, Firma: *See—*
Kaschura, Paul, 3,813,719.
Mallinckrodt Chemical Works: *See—*
Eloy, Fernan G. F.; and Goldberg, Morton E., 3,814,711.
Hoey, George B.; Peckels, Donald R.; and Wiegert, Philip E., 3,814,769.
Mallory, P. R., & Co.: *See—*
Brown, William R., 3,814,874.
Mallory, P. R., & Co., Inc.: *See—*
Sweany, Louis P., 3,815,129.
Malmgren, George L. Humidifier. 3,814,393, Cl. 261-80.000.
Maloney, Joseph H., to Allis-Chalmers Corporation. Stabilizing apparatus for lift trucks. 3,814,026, Cl. 104-246.000.
Manke, Girard M.; Schuldt, Theodore J., Jr.; and Klein, James A., to Collins Radio Company. Gust compensation for angle-of-attack referenced aircraft speed control system. 3,814,912, Cl. 235-150.200.
Mannesmann Aktiengesellschaft: *See—*
Meyer, Walter; and Quitmann, Walter, 3,814,646.
Mannesmann-Meer Aktiengesellschaft: *See—*
Hiersig, Heinz M.; Hansgen, Klaus; Ridder, Gerhard; and Sudhoff, Wolfgang, 3,813,897.
Manof, Alexandru-Ioan-Bogdan I.: *See—*
Simionescu, Radu; Manof, Alexandru-Ioan-Bogdan I.; and Nita, Constantin T., 3,814,092.
Mansei Kogyo Kabushiki Kaisha: *See—*
Goto, Kenjiro, 3,814,571.
Manton, John C.: *See—*
Nibby, Chester M.; and Manton, John C., 3,814,921.
Nibby, Chester M.; Manton, John C.; Franklin, Benjamin S.; and Curley, John L., 3,814,922.
Mar, Jerry, to Bell Telephone Laboratories, Incorporation. Multiple function logic circuit. 3,814,951, Cl. 307-215.000.
Marathon Electric Manufacturing Corporation: *See—*
Sleeter, Michael Roy, 3,815,071.
Marathon Oil Company: *See—*
Gillig, Frederick S.; Smolka, Frank R.; and Trembly, Lynn D., 3,813,784.
Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories, Incorporated. Optical cable including a plurality of single material fibers. 3,814,499, Cl. 350-96.0wg.
Marguette Electronics, Inc.: *See—*
Griffin, John H., 3,815,035.
Marino, Nicholas A.: *See—*
Greenblatt, Irwin; and Marino, Nicholas A., 3,814,107.
Marritt, Clifford R.: *See—*
Labbe, Francis A. M.; Preston, Edward G.; Hodsall, Brian; and Marritt, Clifford R., 3,813,996.
Marshall, Albert H.; and Siragusa, George A., to United States of America, Navy. Laser device for moving target marksmanship training. 3,813,795, Cl. 35-25.000.

Marshall, Robert Moore; Pak, Sung Kun; and Dardoufas, Kimon Constantine, to Allied Chemical Corporation. Polyester yarn. 3,814,627, Cl. 117b138.80f.

Martin, Anthony John: *See—*
Windett, Robert Michael; and Martin, Anthony John, 3,813,960.

Martin, Henry; and Drabek, Josef, to Ciba-Geigy AG. Control of insects and nematodes with vinyl phosphate derivatives. 3,814,798, Cl. 424-200.000.

Martin, Henry; and Pissiotas, Georg, to Ciba-Geigy AG. Derivatives of N-alkinyltrihalogenimidazole for combating ectoparasites. 3,814,801, Cl. 424-273.000.

Martin, James R., to General Motors Corporation. Piston assembly for power transmission. 3,814,225, Cl. 192-85.0aa.

Martin Marietta Aluminum Inc.: *See—*
Simpson, Eric, Jr.; and Fried, Morton, 3,813,839.

Martin Mariette Corporation: *See—*
Kolan, Andrew, 3,814,308.

Martin, Paul E.; Sherrill, William M.; and Green, Terence C., to United States of America, Air Force. Direction finding interferometer for a linear FM signal. 3,815,135, Cl. 343-113.00r.

Martin, Richard D.: *See—*
Calvert, Corlette C.; Morgan, Neal O.; and Martin, Richard D., 3,814,057.

Martin, Ronald P.: *See—*
Wooldridge, James E.; and Martin, Ronald P., 3,813,843.

Martinez, Boni Philip; and Pruckmayr, Gerfried, to Du Pont de Nemours, E. I., and Company. Polyester fabrics coated with ethylene copolymer dispersions. 3,814,623, Cl. 117-135.500.

Martinez, Felix Jesus, to Baxter Laboratories, Inc. Injection site for flow conduits containing biological fluids. 3,814,137, Cl. 138-103.000.

Martone, Ronald J.; Goldman, Samuel C.; and Wolczek, Walter, to Picker Corporation. Scintillation camera with improved light diffusion. 3,814,938, Cl. 250-366.000.

Marui, Yoshitaka: *See—*
Morita, Masayuki; and Marui, Yoshitaka, 3,814,984.

Maruyama, Shoji; Kojima, Katue; Kubota, Tomio; and Ohta, Masafumi, to Ricoh Co., Ltd. 6,6'-Methylene bis [2-styryl benzopyrylium salts] as sensitizers for use in electrophotographic light-sensitive materials. 3,814,752, Cl. 260-240.00d.

Maruzen Oil Company: *See—*
Suzuki, Hiroshi; Iriuchijima, Makoto; Nakamura, Koichi; and Yagi, Kazuharu, 3,814,724.

Marwitz, Heinrich: *See—*
Nitzsche, Siegfried; Marwitz, Heinrich; and Hockemeyer, Friedrich, 3,814,731.

Marx, Wolf-Rudiger: *See—*
Gast, Theodor; Twisselmann, Lorenz; and Marx, Wolf-Rudiger, 3,815,018.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Lohr, Joachim, 3,814,066.

Maschinenfabrik Fr. Niepmann & Co.: *See—*
Niepmann, Otto, 3,813,997.
Niepmann, Otto, 3,814,301.

Maschinenfabrik Zuckermann Komm, Ges. Wien: *See—*
Schmidt, Erich, 3,814,153.

Maskell, John S.; and Dykehouse, Roger D., to Sealed Power Corporation. Device for pneumatically loading piston assemblies into engine block cylinder bores. 3,813,755, Cl. 29-252.000.

Massa Division, Dynamics Corporation of America: *See—*
Massa, Frank, 3,814,621.

Massa, Frank, to Massa Division, Dynamics Corporation of America. Methods of and means for coating articles employing sonic energy. 3,814,621, Cl. 117-114.00b.

Mast, Raymond L.: *See—*
Fraser, Joseph Wilfred, Jr.; Lam, Charles T. W.; and Mast, Raymond L., 3,814,586.

Masters, A. M., & Sons, Inc., mesne: *See—*
Masters, Cardinal M.; Reed, Willard H.; and Wentzell, Ralph H., 3,813,797.

Masters, Cardinal M.; Reed, Willard H.; and Wentzell, Ralph H., to Masters, A. M., & Sons, Inc., mesne. Multiple film viewer and storage cabinet. 3,813,797, Cl. 40-36.000.

Masters, Philip C., to McNeil Corporation. Nozzle. 3,814,330, Cl. 239-558.000.

Masuda, Noboru; and Juroyanagi, Masasi, to Denki Onkyo Co., Ltd. Contactless switching apparatus. 3,814,956, Cl. 307-309.000.

Matchell, Raymond, to Flying spot film scanner providing increased time for film full-down. 178/007.200, 3,814,850, Cl. .

Matsufuji, Akira; Kishikawa, Kanichi; Sasaki, Yasuto; Miyaji, Susumu; and Tutui, Fumihiro, to Nippon Steel Corporation. Three roll type shape steel rolling mill. 3,813,912, Cl. 72-224.000.

Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, to Kanagafuchi Boseki Kabushiki Kaisha. Spinnerets for producing multi-segment filaments. 3,814,561, Cl. 425-131.000.

Matsumura, Taroemon; and Hasegawa, Tadashi, to Matsushita Electronics Corporation. Color image pick-up tube having a silicon target plate. 3,814,965, Cl. 313-367.000.

Matsunaga, Mitsuro: *See—*
Kobayashi, Sadao; Tazawa, Eiichi; Matsunaga, Mitsuro; Hoshino, Chikafusa; and Kunisaki, Hideo, 3,814,619.

Matsushita Electric Industrial Co., Ltd.: *See—*
Fujisawa, Kiyoji; and Tomita, Masao, 3,815,039.
Otani, Hiroshi; and Yukami, Noboru, 3,814,897.

Matsushita Electric Works, Ltd.: *See—*
Yamada, Kiyoshi; Kobayashi, Tadashi; and Morisue, Kazuschige, 3,814,833.

Matsushita Electronics Corporation: *See—*
Kamiya, Shigeru; Ohtsuka, Hitoshi; and Ueda, Kensaku, 3,814,969.
Matsumura, Taroemon; and Hasegawa, Tadashi, 3,814,965.

Matsushito Electric Industrial Co., Ltd.: *See—*
Atsumi, Tomoo, 3,814,440.

Matthews, Donnell R., Jr.: *See—*
Hunt, Duane A., 3,813,877.

Matthews, William J.; and Macano, Samuel J.., to General Signal Corporation. Electronic brake control system. 3,814,484, Cl. 303-20.000.

Mattsson, Erik B. Chair. 3,814,477, Cl. 297-419.000.

Maubon, Andre, to Creusot-Loire Entreprises. Device for collecting gases from a converter. 3,814,402, Cl. 266-16.000.

Maunsell, Henry Ian Geoffery; Millard, John Brennan; Pan, John William; and Schottle, John Jeffrey. Dual mode phase locked loop. 3,815,042, Cl. 331-11.000.

Mauramatsu, Tateo, to Brigestone Tire Company Limited. Flexible pipe connector. 3,814,468, Cl. 285-114.000.

May, Paul L.; and Poe, Richard J., to Baldwin Electronics, Inc. Photoelectric encoder assembly. 3,815,125, Cl. 340-347.00p.

Mayer, Ferdy, 50% to Laboratoire d'Electronique et d'Automatique Dauphinois, L.E.A.D. Capacitance/inductance distance measurement device. 3,815,020, Cl. 324-61.00r.

Mayer, Robert: *See—*
Iglesias, Edmundo J.; and Mayer, Robert, 3,814,542.

Mc Donnell Douglas Corporation: *See—*
Lemons, Carl Robert, 3,814,275.

Mc Intosh, James A., to Mack-Wayne Plastics Company. Linerless closure for a container. 3,814,274, Cl. 215-344.000.

McAinsh, James: *See—*
Ganderton, David; McAinsh, James; and Varney, Gordon, 3,814,097.

McBeath, Donald G.: *See—*
Boss, Garold D.; Crane, Vaemond H.; McBeath, Donald G.; and Thompson, Martin D., 3,815,101.

McCabe, Francis J. Fire damper and method of fabricating same. 3,814,165, Cl. 160-207.000.

McCardle, Arthur, Jr.; Sponseller, Robert Lee; and Gross, Charles Henry, to General Electric Company. Variable area convergent-divergent exhaust nozzle. 3,814,325, Cl. 239-265.390.

McCarthy, John P.: *See—*
Smadar, Yechiel; Roth, Howard; McCarthy, John P.; and Moyer, John, 3,814,560.

McClain, Stephen A.; Doman, Harvey A.; and Entus, Richard D., to Cascade Pole Company. Fiberglass pole and method and apparatus for fabricating same. 3,813,837, Cl. 52-309.000.

McClure, Donald Avery; and Nichols, Harvey Clay, to RCA Corporation. Balanced, low impedance, high frequency transmission line. 3,815,054, Cl. 333-5.000.

McClure, Robert Bruce. Sonic-color system. 3,815,128, Cl. 340-366.00b.

McClusky, Stanley A. Two station receptacle and weighing apparatus. 3,814,196, Cl. 177-54.000.

McConnell, Lorne D., to I-T-E Imperial Corporation. Closed chamber within moving contact. 3,814,884, Cl. 200-148.00b.

McCormick, Harold E.: *See—*
Prasse, Herbert F.; and McCormick, Harold E., 3,814,447.

McCormick, Wayne: *See—*
Brock, George W.; McCormick, Wayne; and Smith, Sidney H., 3,813,766.

McCreight, Louis R.: *See—*
United States of America, National Aeronautics and Space Administration with respect to an invention of, 3,814,678.

McCulloch Corporation: *See—*
Frederickson, Robert Eugene; and Hammond, Joseph, 3,813,776.

McCullough, John E.: *See—*
Gabron, Frank; and McCullough, John E., 3,814,361.

McDermott, William C., to Allis-Chalmers Corporation. Adjustable corn head. 3,813,858, Cl. 56-119.000.

McDonald, Lester E. Handbag with a theft alarm and protection device. 3,815,118, Cl. 340-283.000.

McEachnie, William E.: *See—*
Peach, John B.; and McEachnie, William E., 3,814,837.

McFarland, Harold L., Jr.: *See—*
Cohen, John B.; Janson, Paul E.; and McFarland, Harold L., Jr., 3,815,099.

McGettigan, Marian M., to American Home Products Corporation. N-trihaloacetyl aspartic acid dipeptide ester sweetening agents. 3,814,747, Cl. 260-112.500.

McGill Manufacturing Company, Inc.: *See—*
Osika, Thomas F., 3,814,871.

McGinley, Patrick; and Formica, Santo J., to Container Corporation of America. Tree root container. 3,814,239, Cl. 206-423.000.

McGinnis, James J.: *See—*
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E., 3,814,356.

McGovern, Frank J., to Ecodyne Corporation. Filter cartridges removal means. 3,814,256, Cl. 210-323.000.

McGrath, Ronald P.; and Bleher, William A., to General Instrument Corporation, mesne. Self-clocking NRZ recording and reproduction system. 3,815,108, Cl. 360-41.000.

McHenry, Raymond R., to Calspan Corporation. Spiral jump stunt apparatus. 3,814,021, Cl. 104-69.000.

McIntosh, Brian H.: *See—*
Nystrand, Ernst Daniel; and McIntosh, Brian H., 3,814,100.

McKee, Joseph W. Method and apparatus for reducing emission of pollutants in exhaust gas from internal combustion engine. 3,813,878, Cl. 60-303.000.

McKinney, Joel D.: *See—*
Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., 3,814,682.
Christman, Robert D.; McKinney, Joel D.; and Wilson, Geoffrey R., 3,814,683.
Christman, Robert D.; Elliott, George E., Jr.; and McKinney, Joel D., 3,814,684.

McKinney, Joel D.; and Paraskos, John A., to Gulf Research & Development Company. Control of asphaltic oil hydrodesulfurization process. 3,814,681, Cl. 208-210.000.

McLaughlin, James H.: *See—*
Fenske, Ellsworth R.; and McLaughlin, James H., 3,813,925.

McLaughlin, Patrick H.: *See—*
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E., 3,814,356.

McMains, Standlee N. Disposable pillar set for cakes. 3,814,032, Cl. 108-101.000.

McNally, Donald E.: *See—*
Baker, Richard H.; McNally, Donald E.; and Armstrong, Michael J., 3,814,474.

McNally, George S.; and Sims, Roger D., to Pullman Incorporated. Lading strap anchor. 3,814,029, Cl. 105-369.00a.

McNally, Peter J.: *See—*
Van Gordon, Donald V.; and McNally, Peter J., 3,814,276.

McNeil Corporation: *See—*
Masters, Philip C., 3,814,330.
Pamer, Karl A., 3,814,211.

McQuade, John E., Jr.: *See—*
Scher, Herbert I.; Ungar, Israel S.; and McQuade, John E., Jr., 3,814,647.

McVittie, Harland E. Sleev-lok anchors. 3,813,986, Cl. 85-75.000.

McWilliams, Donald E.; Killmeyer, Charles W.; and Eilerman, George E. Method of sizing glass fiber strand and articles produced therefrom. 3,814,592, Cl. 65-3.000.

Mead Corporation, The: *See—*
Forrer, Homer W., 3,814,237.
Wood, Prentice J., 3,814,238.

Meale, Dory J., Sr., to National Telephone and Supply Co. Connector for insulated conductors. 3,814,836, Cl. 174-84.00c.

Mechin, Bernard J.: *See—*
Leynaert, Jacky R.; and Mechin, Bernard J., 3,814,323.

Medler, Edwin J.: *See—*
Rudat, Emil A.; and Medler, Edwin J., 3,814,033.

Meeder, Donald R.: *See—*
Gilmartin, Earl J., Jr.; Allen, Alfred E., Jr.; and Meeder, Donald R., 3,814,825.

Meierhofer, Karl: *See—*
Eder, Josef; and Meierhofer, Karl, 3,813,803.

Meininger, Fritz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; Meininger, Fritz; Mischke, Peter; and Schon, Franz, 3,814,579.

Meisenburg, Ewald: *See—*
Erlmeier, Robert; Hilberath, Freidrich; Meisenburg, Ewald; and Spengler, Gunter, 3,814,679.

Meissner, Hans Jurgen, to Dhein, Rolf. Bayer Aktiengesellschaft. 3,814,709, Cl. Lacquer binders especially su.

Melachouris, Nicholas, to Stauffer Chemical Company. Peroxide treated protein phosphate complex. 3,814,745, Cl. 260-112.00r.

Mellor, Harrison Clay. Game board with movable attached pieces. 3,814,433, Cl. 273-132.000.

Melreit, Robert V., to Royal Appliance Manufacturing Co., Inc. Water aerating device. 3,814,399, Cl. 261-124.000.

Meltzer, Harold: *See—*
Wood, M. Dale, 3,814,680.

Memorex Corporation: *See—*
Gardner, Thomas E.; and Popovici, Mihail C., 3,815,097.
Stoddard, David L.; Balbas, Frank M.; and Brown, David A., 3,815,150.

Menikheim, Virginia C., to Monsanto Company. Method for producing graphitizable substrates from acrylic fibers. 3,814,577, Cl. 8.115.500.

Menne, Eugene P., to Johnson Diversified, Inc. Dual drag for fishing reels. 3,814,349, Cl. 242-217.000.

Merck & Co., Inc.: *See—*
Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., 3,813,817.
Everson, Charles W.; Danner, Wilson E.; and Hammes, Paul A., 3,814,817.

Mercorelli, John N. Apparatus for drawing designs. 3,813,787, Cl. 33-174.00b.

Merrill, Harold Edward: *See—*
Goodchild, Keith Trevor; and Merrill, Harold Edward, 3,813,973.

Merry, Carl Alan, to Schaefer Marine Products. Mast cable assembly. 3,814,835, Cl. 174-70.00r.

Merten, Rudolf: *See—*
Fischer, Rolf; and Merten, Rudolf, 3,814,776.

Merz, Herbert. Mechanical overrunning braking system for trailers or the like. 3,814,218, Cl. 188-112.000.

Mesh, Theodore, to Gilbert and Barker Manufacturing Company. Electronic dispensing nozzle. 3,814,146, Cl. 141-1.000.

Mesh, Theodore Julius; and Devine, George Thomas, to Gilbert & Barker Manufacturing Company. Pulse generating apparatus responsive to shaft rotation. 3,814,934, Cl. 250-231.0se.

Metal Innovations, Inc.: *See—*
Ayers, Maurice Donald, 3,814,558.

Metalcraft (Bristol) Limited: *See—*
Ward, Maurice Leonard, 3,814,280.

Metrophysics, Inc.: *See—*
Hayo, Frank J., 3,815,130.

Metropolitan Chicago Baptist Association: *See—*
Spencer, Owen C., 3,814,144.

Metz Apparatewerke INH. Paul Metz: *See—*
Pecher, Wolfgang; and Schottner, Helmut, 3,814,985.

Metzger, Karl Georg: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,814,756.

Meyer, Hans, to Gfa-Antriebstechnik Gesellschaft mit beschrankter Haftung. Locking device for a winding arrangement. 3,813,958, Cl. 74-425.000.

Meyer, Paul C.; and Schulz, Manfred B., to Raytheon Company. Continuous surface wave device. 3,815,056, Cl. 333-30.00r.

Meyer, Richard C., to United Aircraft Corporation. Vibrating cylinder force transducer. 3,813,934, Cl. 73-141.00r.

Meyer, Walter; and Quitmann, Walter, to Mannesmann Aktiengesellschaft. Method and apparatus for jacketing a steel pipe. 3,814,646, Cl. 156-195.000.

Meyers, Leo J., to Grant, Louis A., Inc. Slag skimming apparatus. 3,814,407, Cl. 266-37.000.

Mezger, Robert H., to Sperry Rand Corporation. Power transmission. 3,814,250, Cl. 210-90.000.

Miano, Gene L. Television picture projecting device. 3,814,509, Cl. 350-321.000.

Michaelis, Maximilian G. A. C. Means providing random movement especially for use in luminous fountains. 3,814,318, Cl. 239-23.000.

Micro-Bit Corporation: *See—*
Smith, Donald O., 3,815,094.

Microsystems International Limited: *See—*
Cowpland, Michael C. J., 3,815,050.

Middlemiss, Herbert, to Howson-Algraphy Limited. Contact screens. 3,814,608, Cl. 96-116.000.

Mierzwinski, Eugene P., to Magnavox Company, The. Ambient light responsive control of brightness, contrast and color saturation. 3,814,852, Cl. 178-7.5dc.

Miglore, C. Michael, to General Electric Company. Method of adaptive thread. 3,813,908, Cl. 72-16.000.

Miguel, Francisco Angel de Iturribarria; and Zalbide, Angel de Urruticoechea. Marine levelmeter. 3,813,941, Cl. 73-313.000.

Milam, David, to United States of America, Air Force. Ultra-fast terminator for intense laser pulses. 3,814,503, Cl. 350-160.00r.

Milankov, Dimitrije: *See—*
Milankov, Milojc; and Milankov, Dimitrije, 3,814,197.

Milankov, Milojc; and Milankov, Dimitrije. Ice vehicle. 3,814,197, Cl. 180-3.00r.

Mildrex Corporation, mesne: *See—*
Beggs, Donald, 3,814,174.

Miler Laboratories, Inc.: *See—*
Fraser, Joseph Wilfred, Jr.; Lam, Charles T. W.; and Mast, Raymond L., 3,814,586.

Miles Laboratories, Inc.: *See—*
Blake, Kenneth Allen; Haden, Billy Harper; Hendershot, William Fred; and Johnson, La Vell Rolfson, 3,814,668.
Freade, Ronald; and Haden, Billy Harper, 3,814,670.
Ward, Frederick Edmund, 3,814,767.

Milianowicz, Stanislaw A., to Westinghouse Electric Corporation. Gas-blast circuit interrupter with insulating arc shield. 3,814,883, Cl. 200-148.00g.

Milkovic, Miran, to General Electric Company. Current transformer terminated by active load elements for providing phase-inverted signals. 3,815,011, Cl. 323-6.000.

Milkovic, Miran, to General Electric Company. Current transformer with active load termination for providing, inter alia, phase angle alteration. 3,815,012, Cl. 323-6.000.

Milkovic, Miran, to General Electric Company. Current transformer with active load termination. 3,815,013, Cl. 323-6.000.

Millard, John Brennan: *See—*
Maunsell, Henry Ian Geoffery; Millard, John Brennan; Pan, John William; and Schottle, John Jeffrey, 3,815,042.

Miller, Glenn A. Portable fuel igniter. 3,814,035, Cl. 110-1.00f.

Miller, Harry Lloyd, to Western Electric Company, Incorporated. Telephone subscriber line terminating test circuit. 3,814,870, Cl. 179-175.20b.

Miller, James E., to Minnesota Mining and Manufacturing Company. Apparatus for applying terminals from a carrier strip to wire. 3,813,753, Cl. 29-203.0dt.

Miller, Lyle Eugene, to Deere & Company. Instrument panel cover. 3,814,205, Cl. 180-90.000.

Miller, Mickey J., to Harnischfeger Corporation. Hydraulic crane control system having means for deactivating control valves when operating limit is exceeded. 3,814,265, Cl. 212-35.000.
Miller, Paul W., to Wean United, Inc. Magnetic sheet classifier. 3,814,243, Cl. 209-223.00a.
Miller, Robert D.: *See—*
Aviram, Arieh; Haller, Ivan; Miller, Robert D.; and Young, William R., 3,814,700.
Miller, Robert S., to Tenneco Chemicals, Inc. Preparation of methacrylate copolymers. 3,814,740, Cl. 260-86.10e.
Miller, William John; and Calcote, Hartwell Forrest, to Aerochem Research Laboratories, Inc. Method and apparatus for analyzing organic carbon in aqueous systems. 3,814,583, Cl. 23-230.00r.
Mills, Samuel M.: *See—*
Loyd, Patrick V.; and Mills, Samuel M., 3,814,139.
Minagawa, Nobuhiko: *See—*
Kasugai, Tsuneo; Minagawa, Nobuhiko; and Sato, Masamichi, 3,814,617.
Minieri, Pasquale P., to Tenneco Chemicals, Inc. Indazole preservatives for aqueous synthetic resin containing compositions. 3,814,714, Cl. 260-29.6mn.
Minneman, William J., to MTM Molded Products Company. Loading block. 3,813,987, Cl. 86-44.000.
Minnesota Automotive, Inc.: *See—*
Cords, Frederick W., 3,813,883.
Minnesota Mining and Manufacturing Company: *See—*
Miller, James E., 3,813,753.
Minolta Camera Kabushiki Kaisha: *See—*
Ishihara, Kazuo, 3,815,149.
Yata, Kotaro; Nanba, Yasuhiro; and Sahara, Masayoshi, 3,815,148.
Minton, Leslie Graham; and Hughes, Anthony Edward David. Compulsory seat belts. 3,815,086, Cl. 340-52.00e.
Misaki, Inosuke, to Nitto Shoji Limited. Twist transmission device for a ring spinning apparatus. 3,813,869, Cl. 57-106.000.
Mischke, Peter: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; Meininger, Fritz; Mischke, Peter; and Schon, Franz, 3,814,579.
Mishima, Fumiyuki: *See—*
Ozaki, Yoshiaki; and Mishima, Fumiyuki, 3,814,015.
Misumi, Akira; and Kasai, Toshiaki, to Hitachi, Ltd. Post-deflection acceleration type color cathode-ray tube. 3,814,966, Cl. 313-408.000.
Mitchael, William L.: *See—*
Rennick, Lyle V.; and Mitchael, William L., 3,813,931.
Mitchel & King Skates Limited: *See—*
Staples, John, 3,814,453.
Mitchell, Wallace F., to Ammco Tools, Inc. Tool holder. 3,813,970, Cl. 82-36.00r.
Mitobe, Koichi; and Abe, Katsuo, to Hitachi Ltd. Thermionic emission device having thermal expansion compensating means. 3,814,976, Cl. 313-345.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Ishikawa, Motosuke, 3,813,884.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Shimizu, Katsumi; and Kimura, Mamoru, 3,814,406.
Mitsui Toatsu Chemicals, Inc.: *See—*
Kobayashi, Sadao; Tazawa, Eiichi; Matsunaga, Mitsuro; Hoshino, Chikafusa; and Kunisaki, Hideo, 3,814,619.
Miyagawa Kasei Industry Co., Ltd.: *See—*
Miyagawa, Shiro, 3,814,632.
Miyagawa, Shiro, to Miyagawa Kasei Industry Co., Ltd. Battery and method of manufacturing the same. 3,814,632, Cl. 136-134.00r.
Miyaji, Susumu: *See—*
Matsufuji, Akira; Kishikawa, Kanichi; Sasaki, Yasuto; Miyaji, Susumu; and Tutui, Fumihiro, 3,813,912.
Miyazaki, Murao: *See—*
Taniguchi, Motoji; Kitamura, Shigeo; Ishizawa, Kazutomo; and Miyazaki, Murao, 3,813,919.
Mizuki, Eiiche: *See—*
Mukaida, Yoshito; Kubotera, Kikuo; and Mizuki, Eiiche, 3,814,603.
Moe, Lowell A., to Ramex Company. Methods and apparatus using microwaves for material characteristics measurements. 3,813,918, Cl. 73-15.00b.
Moe, Walter, to Aurora Products Corporation. Football game. 3,814,426, Cl. 273-94.00r.
Moeller, Ricahrd E.: *See—*
Simoneau, Edward T.; Moeller, Ricahrd E.; and Holdstock, Norman G., 3,814,706.
Moen, Alfred M. Plug valve. 3,814,120, Cl. 137-242.000.
Mogul Leisure Products Limited: *See—*
Catlin, William Paul; and Mogul Leisure Products Limited, 3,814,417.
Mohri, Katsuo: *See—*
Watatani, Yoshizumi; and Mohri, Katsuo, 3,815,052.
Molina, Orlando Gomez, to Air Products and Chemicals, Inc., mesne. Water washable penetrant. 3,814,695, Cl. 252-301.20p.
Molins Machine Company Limited: *See—*
Jawor, Tadeusz Bronislaw, 3,813,794.
Moller, Friedrich; Muhlhausen, Cornelius; and Hauptmann, Gunter, to Bayer Aktiengesellschaft. Bicyclic amidine catalsts in polyurethane foam process. 3,814,707, Cl. 260-2.5ac.
Molson, William N.: *See—*
Caplan, Sidney W.; and Molson, William N., 3,813,832.
Monarch Machine Tool Company, The: *See—*
Kuck, Kermit T.; and Gushing, Nagle V., 3,813,745.
Monsanto Company: *See—*
Fowler, Timothy J., 3,814,031.
Menikheim, Virginia C., 3,814,577.
Stoffel, Paul J., 3,814,806.
Wolf, William D., 3,814,784.
Montacie, Marcel, to Union Industrielle Blanzy-Quest. Intermittent advancing device for a rotatable boring machine. 3,814,481, Cl. 299-61.000.
Montecatini Edison S.p.A.: *See—*
Caporiccio, Gerardo; and Strepparola, Ezio, 3,814,741.
Montone, Liber Joseph: *See—*
Hurlbrink, Robert William, III; and Montone, Liber Joseph, 3,814,845.
Mookherjee, Braja D., to International Flavors & Fragrances Inc. Perfume compositions containing hexahydro-1,4,9,9-tetramethyl-4,7-methamoazulenones. 3,814,704, Cl. 252-522.000.
Moore, Charles H. Process of forging and product thereof. 3,813,913, Cl. 72-267.000.
Moore, Philip William: *See—*
Battaerd, Hendrik Adrian Jacobus; Clouston, John Gannon; and Moore, Philip William, 3,814,677.
Moran, Brian J.: *See—*
Van Zutphen, Clement J.; and Moran, Brian J., 3,814,291.
Moran, Robert L.: *See—*
Plunk, Troy E.; and Moran, Robert L., 3,815,055.
Morane, Bruno P.; and Vien, Andre, to L'Oreal. Curling iron. 3,814,113, Cl. 132-36.00r.
Morden, Russell L. Vehicle rear compartment heater. 3,814,314, Cl. 237-12.30b.
Moren, Hugh G., Jr., to Baldt Corporation. Starting device for yarn carrier. 3,814,347, Cl. 242-125.100.
Morgan, Howard William, Jr., to Filter Specialists, Inc. Filter for liquid material. 3,814,261, Cl. 210-453.000.
Morgan, Jay E., to Pillsbury Company, The. High protein food bar. 3,814,819, Cl. 426-72.000.
Morgan, Neal O.: *See—*
Calvert, Corlette C.; Morgan, Neal O.; and Martin, Richard D., 3,814,057.
Morgan, Richard J. Foraminous support platforms. 3,814,030, Cl. 108-51.000.
Morhack, George J., to Lincoln Manufacturing Company, Inc. Steam heating device. 3,814,901, Cl. 219-401.000.
Mori, Toshiyuki, to Olympus Optical Co., Ltd. Optical measuring catheter. 3,814,081, Cl. 128-2.001.
Morisue, Kazuschige: *See—*
Yamada, Kiyoshi; Kobayashi, Tadashi; and Morisue, Kazuschige, 3,814,833.
Morita, Masayuki; and Marui, Yoshitaka, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Device for automatically compensating disconnection in head lamps. 3,814,984, Cl. 315-83.000.
Morresi, Nello; and Villa, Egidio. Sound-absorbing panel for air-conditioning ducts and the like. 3,814,208, Cl. 181-33.00g.
Morris, Harold B., to Seismic Logs, Inc. Geophone treatment. 3,813,744, Cl. 29-25.350.
Morrison, Gary L.: *See—*
Safiuddin, Mohammed; and Morrison, Gary L., 3,814,310.
Morrison, Heber J., to Westinghouse Electric Corporation. Square wave driven power amplifier. 3,815,030, Cl. 328-27.000.
Morse, Jeremy Painter: *See—*
Cometto, Dante James; Morse, Jeremy Painter; Crickmer, Robert Edward; and Kirk, Irvin, 3,814,635.
Mostow, John H., to Colgate-Polmolive Company. Free flowing soap-nonionic detergent. 3,814,692, Cl. 252-108.000.
Motoren Werke Mannheim AG Vorm. Benz Abt Stationarer Motorenbau: *See—*
Hubschmann, Karl Wolfgang, 3,814,553.
Motoren-und Turbinen-Union Munchen GmbH, mesne: *See—*
Bruder, Werner; and Grieb, Hubert, 3,813,874.
Motoren-Werke Mannheim AG vorm. Benz Abt. Stationarer Motorenbau: *See—*
Hubschmann, Karl Wolfgang, 3,813,882.
Motorola, Inc.: *See—*
Fukayama, Gary P., 3,814,300.
Howard, William G., Jr.; and Cecil, James B., 3,815,123.
Nash, Harold Garth; and Wiles, Michael Frederick, 3,814,918.
Parker, Norman W., 3,814,858.
Mould, Peter R.; and Gray, John M., to United States Steel Corporation. Method for production of low carbon steel with high drawability and retarded aging characteristics. 3,814,636, Cl. 148-12.100.
Mousetis, Harry X. Life raft. 3,813,717, Cl. 9-3.000.
Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Germanchuk, Vyacheslav Nikolaevich. Device for electron-beam heating of materials mainly for their melting and evaporation. 3,814,829, Cl. 13-31.000.
Moyer, John: *See—*
Smadar, Yechiel; Roth, Howard; McCarthy, John P.; and Moyer, John, 3,814,560.
MTM Molded Products Company: *See—*
Minneman, William J., 3,813,987.
Mueller Co.: *See—*
Hackman, Frank C., 3,814,379.
Leopold, Wilbur R., Jr., 3,814,466.

Muenchhausen, Meinolf, to Siemens Aktiengesellschaft. Method and circuit arrangement for automatic recognition of characters with the help of a translation invariant classification matrix. 3,815,090, Cl. 340-146.3ma.

Muhlhausen, Cornelius: *See—*
Moller, Friedrich; Muhlhausen, Cornelius; and Hauptmann, Gunter, 3,814,707.

Mukai, Shin. Binocular. 3,814,496, Cl. 350-75.000.

Mukaida, Yoshito; Kubotera, Kikuo; and Mizuki, Eiiche, to Fuji Photo Film Co., Ltd. Method for preparing lithographic printing plate. 3,814,603, Cl. 96-33.000.

Mulholland, Terence H.; and Kruger, Fred B., to Homestead Industries, Inc. Liquid heating feedback system. 3,814,321, Cl. 239-135.000.

Muller, Kurt, to Kabel-und Metallwerke Gutehoffnungshitte Aktiengesellschaft. Method and apparatus for making tubing for metal tape. 3,813,910, Cl. 72-130.000.

Muller, Paul: *See—*
Pollmeier, Franz-Josef; and Muller, Paul, 3,815,073.

Muller, Rudolf: *See—*
Heiler, Wolfgang; Muller, Rudolf; and Becker, Jean-Jacques, 3,814,039.

Mulliken, Richard F.: *See—*
United States of America, National Aeronautics and Space Administration, 3,814,645.

Mullner, Stefan: *See—*
Busch, Wolfram; and Mullner, Stefan, 3,814,718.

Mulvaney, Bruce D.: *See—*
Ellis, William D.; and Mulvaney, Bruce D., 3,814,687.

Mumford, Eustace H., to Owens-Illinois, Inc. Blank mold spray. 3,814,594, Cl. 65-169.000.

Munger, Warren B.: *See—*
Kirby, Charles A.; and Munger, Warren B., 3,814,416.

Murata, Yoshio: *See—*
Takata, Masanobu; Osakabe, Kuniharu; and Murata, Yoshio, 3,814,967.

Murphy, Richard D., to Corduroy Rubber Company. Device for emptying containers. 3,814,270, Cl. 214-302.000.

Murphy, William J.: *See—*
United STates of America, National Aeronautics and Space Administration, 3,813,875.

Murray, Michael F. Apparatus for encapsulating hot gases from high stacks. 3,814,394, Cl. 261-83.000.

Mycek, Edward G.: *See—*
Douglas, James R.; Adams, Lloyd M.; Mycek, Edward G.; and Grafton, David A., 3,814,514.

Nadeau, Herbert G., to Upjohn Company, The. Novel compositions. 3,814,659, Cl. 161-161.000.

Naegeli, Warner, to Pavena A.G. Draftable non-twisted staple fiber band and process for the manufacture of a draftable staple fiber band of high density and breaking length. 3,814,660, Cl. 161-176.000.

Nagano, Shigemichi: *See—*
Yasusaka, Kazuo; and Nagano, Shigemichi, 3,815,133.

Nagata, Yasushi, to Shibaura Electronics Co., Ltd. Thermistor for temperature measurement. 3,815,074, Cl. 338-22.00r.

Nagoshi, Fumiya; Arakawa, Hideyuki; and Saito, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinylidene chloride series resin compositions. 3,814,708, Cl. 260-23.0xa.

Nagy, Daniel Elmer, to American Cyanamide Company. Acrylamide-styrene copolymerization by high-speed shear agitation of aqueous medium containing polyacrylamide. 3,814,742, Cl. 260-88.1pn.

Nagy, Ernest J., to Pullman Incorporated. Laterally movable door and operating mechanism therefor. 3,813,814, Cl. 49-220.000.

Nahon, Roland Sylavain, to Jeumont-Schneider. Stacking store having overflow indication for the transmission of data in the chronological order of their appearance. 3,815,096, Cl. 340-172.500.

Naito, Takayuki; Okumura, Jun; and Kamaxhi, Hajime, to Bristol-Myers Company. 7-O-Aminomethylphenylacetamide)-3-(tetrazolo [4,5-b] pyridazin-6-ylthiomethyl)-3-cephem-4-carboxylic acid. 3,814,755, Cl. 260-243.00c.

Nakagawa, Yasuichi; and Sakuma, Tadashi, to Kabushiki Kaisha Daini Seikosha. Balance wheel assembly for an electric timepiece. 3,813,872, Cl. 58-28.00a.

Nakagawa, Yasukazu, to Kabushiki Kaisha Daini Seikosha. Switching device for electronic watch. 3,813,873, Cl. 58-85.500.

Nakagawa, Yutaka; and Suzuki, Masao, to Sony Corporation. Low voltage D.C. supply circuit. 3,814,851, Cl. 178-7.30r.

Nakamura, Kenya; Kondo, Yasuo; and Kuroyanagi, Makoto, to Nippondenso Co. Ltd., Toyoto Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho. Stationary heat exchanger. 3,814,171, Cl. 165-10.000.

Nakamura, Koichi: *See—*
Suzuki, Hiroshi; Iriuchijima, Makoto; Nakamura, Koichi; and Yagi, Kazuharu, 3,814,724.

Nakanishi, Kiyoshi: *See—*
Inoue, Tokuta; Yamada, Mitsumasa; Nakanishi, Kiyoshi; Tanasawa, Yasushi; and Yamaguchi, Shunzo, 3,813,879.

Nakao, Kazutoshi. Apparatus for crushing fragile material. 3,814,332, Cl. 241-38.000.

Nakatani, Tsugio, to Yamaha Hatsudoki Kabushiki Kaisha. Recoil engine starter. 3,814,073, Cl. 123-185.0ba.

Nakayama, Hiroyuki; and Asasa, Kiyohiko, to Kensai Paint Co., Ltd. Composition for forming an electrically conductive resin film. 3,814,703, Cl. 252-500.000.

Nakayama, Kuniyuki: *See—*
Isshiki, Setsuya; Nakayama, Shiro; and Nakayama, Kuniyuki, 3,814,622.

Nakayama, Shiro: *See—*
Isshiki, Setsuya; Nakayama, Shiro; and Nakayama, Kuniyuki, 3,814,622.

Nalley, Charles E.; and Lovelace, Joseph B., to PPG Industries, Inc. Glass fiber size containing polyolefin emulsion. 3,814,715, Cl. 260-29.6xa.

Nanba, Yasuhiro: *See—*
Yata, Kotaro; Nanba, Yasuhiro; and Sahara, Masayoshi, 3,815,148.

Narisawa, Shizuo: *See—*
Yagi, Yoshiharu; Narisawa, Shizuo; Oshima, Takao; and Hata, Kazuhiko, 3,814,744.

Nash, Harold Garth; and Wiles, Michael Frederick, to Motorola, Inc. Digital filter for a digital demodulation receiver. 3,814,918, Cl. 235-152.000.

Nash, Leonard A., to Teletype Corporation. Record-turntable assembly and method of making. 3,815,146, Cl. 346-137.000.

Nathanson, Harvey C.; Thomas, Richard N.; and Guldberg, Jens, to Lucas, Joseph, (Industries) Limited. Solid state radiation sensitive field electron emitter and methods of fabrication thereof. 3,814,968, Cl. 313-95.000.

National Research Development Corporation: *See—*
Taylor, David Ernest Meguyer, 3,814,082.

National Telephone and Supply Co.: *See—*
Meale, Dory J., Sr., 3,814,836.

Natof, Stuart L.: *See—*
Friend, William H.; Natof, Stuart L.; Reiter, Eugene A.; and Eudman, David W., 3,813,999.

Nattrass, Lawrence A.: *See—*
Kicher, Thomas P.; and Nattrass, Lawrence A., 3,814,470.

Nebe, William John, to Du Pont de Nemours, E. I., and Comapny. Crystalline photopolymerizable compositions with improved storage life. 3,814,607, Cl. 96-115.00p.

Neelen, Gregorius Theodorus Maria, to U.S. Philips Corporation. Hot-gas engine. 3,813,881, Cl. 60-521.000.

Neff, Clarence H., to Felt Products Mfg. Co. Method of sealing a curb and gutter roadway gap and sealing assembly therefor. 3,814,530, Cl. 404-67.000.

Nelson, Isaac Hilton; and Spinks, Heyward Taylor, to Ambac Industries, Incorporated. Trolling motor structure. 3,814,961, Cl. 310-87.000.

Nelson, James W.: *See—*
Lewis, Robert F.; and Nelson, James W., 3,815,139.

Nelson, Jean R., to Winzen Research, Inc. Balloon reefing sleeve and launching method. 3,814,353, Cl. 244-98.000.

Nelson, Roger P.: *See—*
Hess, Hans-Jurgen E.; and Nelson, Roger P., 3,814,766.

Nelson, Roy A., to LTV Aerospace Corporation. Transportation system. 3,814,025, Cl. 104-242.000.

Neubauer, Pierre: *See—*
Lombard, Claude Edmond; Labaune, Camille; and Neubauer, Pierre, 3,815,010.

New Standard Company, Inc., The: *See—*
Stantial, Thomas D., 3,814,023.

Newton, Kirk C.: *See—*
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E., 3,814,356.

Nibby, Chester M.; and Manton, John C., to Honeywell Information Systems Inc. Apparatus and method for a memory partial-write of error correcting encoded data. 3,814,921, Cl. 235-153.0am.

Nibby, Chester M.; Manton, John C.; Franklin, Benjamin S.; and Curley, John L., to Honeywell Information Systems, Inc. Availability and diagnostic apparatus for memory modules. 3,814,922, Cl. 235-153.0ak.

Nichols, Harvey Clay: *See—*
McClure, Donald Avery; and Nichols, Harvey Clay, 3,815,054.

Nichols, William E.: *See—*
Waldspurger, Edward C., 3,814,844.

Nicholson Manufacturing Company: *See—*
Nicholson, Thomas W., 3,814,154.

Nicholson, Thomas W., to Nicholson Manufacturing Company. Inclined chipper. 3,814,154, Cl. 144-172.000.

Nicolay, Karl, to Durkoppwerke G.m.b.H. Sewing apparatus for the formation of edge-piping openings. 3,814,037, Cl. 112-68.000.

Nielsen Engineering & Research Inc.: *See—*
Crumal, Jimmie, 3,813,945.

Niepmann, Otto, to Maschinenfabrik Fr. Niepmann & Co. Device for making cigarette package wrappings. 3,813,997, Cl. 93-12.00c.

Niepmann, Otto, to Maschinenfabrik Fr. Niepmann & Co. Box for cigarettes and cigarillos made from a blank. 3,814,301, Cl. 229-17.00r.

Niizawa, Yoshiki: *See—*
Kimura, Takehiko; Niizawa, Yoshiki; and Hirano, Reiji, 3,815,098.

Nikolov, Ivan Dimov; Rasheev, Gueorgui Nikolov; Sivov, Ferdo Atanasov; Nikolov, Nikolai Yonkov; and Hristov, Chavdar Asenov, to Institut Po Metelozнanic i Technologia Na Metalite. Automatic device for discrete compensation of the metallostatic pressure in achines for casting with gas pressure. 3,814,127, Cl. 137-624.110.

Nikolov, Nikolai Yonkov: *See—*

Nikolov, Ivan Dimov; Rasheev, Gueorgui Nikolov; Sivov, Ferdo Atanasov; Nikolov, Nikolai Yonkov; and Hristov, Chavdar Asenov, 3,814,127.

Nilles, John D.; and Hruby, Frank R., to American Hospital Supply Corporation. Collet adjusting mechanism for dental handpieces. 3,813,782, Cl. 32-26.000.

Nims, Jerry Curtis; and Lo, Allen Kwok Wah, to Dimensional Development Corporation. 3-D screen and system. 3,814,513, Cl. 353-7.000.

Nippon Cable Systems Inc.: *See—*
Fujio, Fumio, 3,815,061.

Nippon Electric Company, Limited: *See—*
Kato, Kotaro, 3,815,034.
Yasusaka, Kazuo; and Nagano, Shigemichi, 3,815,133.

Nippon Kokan Kabushiki Kaisha: *See—*
Ozawa, Naosuke; Sudo, Tachio; and Watanabe, Shigeki, 3,813,921.

Nippon Oil and Fats Company Limited: *See—*
Araki, Masatada, 3,813,758.

Nippon Steel Corporation: *See—*
Matsufuji, Akira; Kishikawa, Kanichi; Sasaki, Yasuto; Miyaji, Susumu; and Tutui, Fumihiro, 3,813,912.
Seki, Masahiko, 3,814,400.

Nippondenso Co. Ltd., Toyoto Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakamura, Kenya; Kondo, Yasuo; and Kuroyanagi, Makoto, 3,814,171.

Nishi, Koji; Kumakura, Itsuo; and Hamaguchi, Ukio, to Aishin Seiki Co., Ltd. and Hamaguchi Indicator Industry Co., Ltd. Automatic fishing device. 3,813,806, Cl. 43-15.000.

Nishiwaki, Niichi: *See—*
Kusuda, Takazo; and Nishiwaki, Niichi, 3,814,207.

Nissan Motor Company, Limited: *See—*
Ichimura, Hiroshisa; and Irie, Namio, 3,813,964.

Nissei Kogyo Kabushiki Kaisha: *See—*
Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, 3,814,778.

Nita, Constantin T.: *See—*
Simionescu, Radu; Manof, Alexandru-Ioan-Bogdan I.; and Nita, Constantin T., 3,814,092.

Nitta, Kazuo. Throw away gas lighter. 3,814,572, Cl. 413-143.000.

Nitto Shoji Limited: *See—*
Misaki, Inosuke, 3,813,869.

Nitzsche, Siegfried; Marwitz, Heinrich; and Hockemeyer, Friedrich, to Wacker-Chemie GmbH. Agents for the manufacture of non-stick coatings. 3,814,731, Cl. 260-46.57a.

Niven, Mary G.: *See—*
Thompson, William W., 3,814,189.

Nix, Hans; and Koob, Werner. Method of measuring thickness of non-metallic paving material with compensation for properties of the material. 3,815,016, Cl. 324-34.0tk.

Nolley, John Paul, Jr., to Universal Oil Products Company. Emulsion separation apparatus. 3,814,262, Cl. 210-519.000.

Non-toxic gas generation: *See—*
Klager, Karl; and Dekker, Albert O., 3,814,694.

Nony, Maurice: *See—*
Bertrand, Pierre; and Nony, Maurice, 3,814,119.

Nopper, Peter; Zumbach, Heinz; and Brunner, Mathias. Beat frequency method and apparatus for measuring the thickness of a layer of material overlying a metallic surface. 3,815,017, Cl. 324-34.00r.

Nordson Corporation: *See—*
Rombach, Frank; and Venlet, Cornelis N., 3,814,002.

Norman, David, to Becton, Dickinson and Company. Vessel cannulator and clamp for lymphangiography. 3,814,080, Cl. 128-2.00m.

Norrish, John H. Load securing apparatus for pickup trucks. 3,814,460, Cl. 280-179.00r.

Northern Illinois Gas Company: *See—*
Batz, James E., 3,815,126.

Northrop Corporation: *See—*
Rennick, Lyle V.; and Mitchael, William L., 3,813,931.

Northwest Design Products, Inc.: *See—*
Kirby, Charles A.; and Munger, Warren B., 3,814,416.

Nozik, Arthur Jack. Infrared windows and optical coatings for same derived from $CD2SNO4$. 3,815,036, Cl. 330-4.300.

Numertap, Inc.: *See—*
Steiner, Rudolph, 3,814,535.

Nuovan San Giorgio S.p.A.: *See—*
Viglione, Giovanni, 3,813,870.

Nussbaumer, Henri J., to International Business Machines Corporation. Signal processing device for weighting delta coded sequences by pair wise summation of coefficients according to the matching condition of counterpart. 3,814,917, Cl. 235-152.000.

N.V. Veluwse Machine Industrie: *See—*
Friberg, John Inge Ronnie; and Fritjofsson, Sture Fingal Esaias, 3,813,974.

Nystrand, Ernst Daniel; and McIntosh, Brian H., to Paper Converting Machine Co., Inc. Disposable diaper. 3,814,100, Cl. 128-287.000.

O'Brien, Loren James, to Dana Corporation. V-drive system. 3,814,201, Cl. 180-44.00r.

Occidental Energy Development Company, mesne: *See—*
Bjorkman, Harry K., Jr., 3,814,630.

O'Day, Richard L.; and Shelledy, Frank B., to International Business Machines Corporation. Internally biased magnetoresistive magnetic transducer. 3,814,863, Cl. 360-113.000.

Oelbe, Hans-Werner: *See—*
Grosch, Hermann; and Oelbe, Hans-Werner, 3,813,938.

Office Nationale d'Etude et de Recherches Aerospatiales: *See—*
Leynaert, Jacky R.; and Mechin, Bernard J., 3,814,323.

Ogawa, Yasuhisa: *See—*
Ozawa, Mitsuo; and Ogawa, Yasuhisa, 3,814,606.

Oguma, Toshiro: *See—*
Inoue, Kozo; Hara, Toshito; Kitazawa, Takeo; Yamamoto, Kazuyoshi; and Oguma, Toshiro, 3,814,612.

Ohara Iron Works Co., Ltd.: *See—*
Kamimura, Seigoro; Imai, Masaji; and Azegami, Takeo, 3,814,259.

Ohta, Masafumi: *See—*
Maruyama, Shoji; Kojima, Katue; Kubota, Tomio; and Ohta, Masafumi, 3,814,752.

Ohtsuka, Hitoshi: *See—*
Kamiya, Shigeru; Ohtsuka, Hitoshi; and Ueda, Kensaku, 3,814,969.

Oka, Shoji; and Wakabayashi, Takashi, to Toyo Rubber Industry Co., Ltd., The. Method of making footwear having a polyurethane sole. 3,814,781, Cl. 264-54.000.

Okabe, Katsuhiko, to Kabushikikaisha Copal. Mechanism for moving a printing head in a printer. 3,814,230, Cl. 197-60.000.

Okugawa, Katuo: *See—*
Hirano, Tadao; Toda, Sadasuke; and Okugawa, Katuo, 3,815,087.

Okumura, Jun: *See—*
Naito, Takayuki; Okumura, Jun; and Kamaxhi, Hajime, 3,814,755.

Okumura, Masaru: *See—*
Hashida, Taizo; Okumura, Masaru; and Fujishima, Hiroyasu, 3,814,162.

O'Leary, Denis F.: *See—*
Dautel, John D.; O'Leary, Denis F.; and Turner, Hubbard C., Jr., 3,815,131.

Olikraft, Inc.: *See—*
Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., 3,814,302.

Olin Corporation: *See—*
Csejka, David A.; and Lederle, Henry F., 3,814,691.

Olinkraft, Inc.: *See—*
Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., 3,813,844.

Oliver, Don L., to Cities Service Oil Company. Well fishing apparatus. 3,814,180, Cl. 166-99.000.

Oliver, Louise. Service window controlled seat conveyor system. 3,814,020, Cl. 104-25.000.

Oliver, Robert J.; and Turner, Earl W., to International Telephone and Telegraph Corporation. Methods for protecting the color of cut bone surfaces in fresh and frozen meat. 3,814,821, Cl. 426-265.000.

Olivieri, Icaro. . 3,813,796, Cl. Anchoring base for the lacing.

Olsen, Robert A.: *See—*
Yang, Jih Hsin; and Olsen, Robert A., 3,814,823.

Olsen, Willi, to Siemens Aktiengesellschaft. Metal-enclosed high voltage line. 3,814,831, Cl. 174-28.000.

Olson, Robert L.; and Frazeir, Dean R., to Grain Processing Corporation. Process for producing cottonseed protein isolates. 3,814,748, Cl. 260-123.500.

Oltmanns, George F. Insulator and support for electrically charged fence wires. 3,814,384, Cl. 256-10.000.

Olympus Optical Co., Ltd.: *See—*
Harada, Kenichi, 3,814,505.
Mori, Toshiyuki, 3,814,081.

Omark-Winslow Aerospace Tool Co.: *See—*
Southland, John Robert, 3,813,823.

Omnitech Inc.: *See—*
DeAngelis, Armand; and Laliberte, Albert J., 3,814,094.

Onodera, Yutaka: *See—*
Tanaka, Eihachiro; Onodera, Yutaka; Fukuda, Takeji; Yamashita, Tsutomu; and Kuma, Shoji, 3,813,764.

Orbison, Frank H.; and Halland, Howard M., to Appleton Mills. Single endless strand mounted in a series of paralled convolutions as a fibrous web supporting surface in a papermaking machine. 3,814,665, Cl. 162-274.000.

Orbit Beratungsgesellschaft GmbH: *See—*
Lindemann, Wolfgang, 3,813,748.

Orenstein & Koppel AG: *See—*
Frick, Egon, 3,814,264.

Ormeachea, Jose Joaquin Aguirre. Steel making apparatus. 3,814,405, Cl. 266-34.00t.

Orne, Laurence E. Stable signal generator. 3,815,053, Cl. 331-168.000.

Osaka Gas Kabushiki Kaisha: *See—*
Kusuda, Takazo; and Nishiwaki, Niichi, 3,814,207.

Osakabe, Kuniharu: *See—*
Takata, Masanobu; Osakabe, Kuniharu; and Murata, Yoshio, 3,814,967.

Osbond, John Mervyn; and Wickens, James Charles, to Hoffmann-La Roche Inc. Cyclopropane carboxylic acid esters as insecticides. 3,814,805, Cl. 424-306.000.

Osborn, Dale B.; and Hill, William R., to GTE Sylvania Incorporated. Adjustable mirror mount. 3,814,507, Cl. 350-285.000.

Oshima, Takao: *See—*
Yagi, Yoshiharu; Narisawa, Shizuo; Oshima, Takao; and Hata, Kazuhiko, 3,814,744.

Osika, Thomas F., to McGill Manufacturing Company, Inc. Joystick controller for multiple switch assembly. 3,814,871, Cl. 200-6.00a.

Ostwald, Richard, to Smith, Gordon, & Co., Inc. Seal assembly for air compressor valve. 3,814,546, Cl. 417-298.000.

Oswald, Thomas L.; and Wolf, Alby H., to Gould Inc. Air leak detector. 3,813,922, Cl. 73-49.200.

Otani, Hiroshi; and Yukami, Noboru, to Matsushita Electric Industrial Co., Ltd. Thermal printing head. 3,814,897, Cl. 219-216.000.

Oulevay, Serge, to Bolex International S.A. Kinematographic projector. 3,814,511, Cl. 352-91.000.

Over, William Roderick: *See—*
Brehm, Ronald Carl; and Over, William Roderick, 3,813,915.

Overzet, John K.: *See—*
Studtmann, George H.; and Overzet, John K., 3,815,008.

Owens-Illinois, Inc.: *See—*
Mumford, Eustace H., 3,814,594.

Oxy Metal Finishing Corporation, mesne: *See—*
Adamowicz, Norman C.; Klein, Roy W.; and Tremmel, Robert A., 3,814,674.

Ozaki, Yoshiaki; and Mishima, Fumiyuki, to Janome Sewing Machine Co., Ltd. Printing machine with a roller platen releasing device. 3,814,015, Cl. 101-269.000.

Ozawa, Mitsuo; and Ogawa, Yasuhisa, to Fuji Photo Film Co., Ltd. Color photographic processing composition. 3,814,606, Cl. 96-66.100.

Ozawa, Naosuke; Sudo, Tachio; and Watanabe, Shigeki, to Nippon Kokan Kabushiki Kaisha. Method of testing the weld zones of roll construction using pressurized air. 3,813,921, Cl. 73-40.000.

Pacini, August J., to Purex Corporation, Ltd. Use of cobalt dodecenedioate for treating skin conditions. 3,814,804, Cl. 424-295.000.

Page, Jerome M.: *See—*
Case, Robert O., Jr.; and Page, Jerome M., 3,815,132.

Pahr, Gustav Oskar. Projectile tethered to linked resilient flexible line. 3,814,427, Cl. 273-95.00a.

Pak, Sung Kun: *See—*
Marshall, Robert Moore; Pak, Sung Kun; and Dardoufas, Kimon Constantine, 3,814,627.

Palazzetti, Mario; Cavallarin, Bruno; and Villa, Giovanni, to Fiat Societa per Azioni. Process for the manufacture of electrical coils. 3,815,069, Cl. 336-200.000.

Pallari, Kyosti. Stump pulling and crushing device. 3,814,152, Cl. 144-2.00n.

Palmieri, Frederick W.; and Pettingell, John S., to Computer Equipment Corporation. Sailing computer. 3,814,910, Cl. 235-150.200.

Pamer, Karl A., to McNeil Corporation. Air space vehicle servicing apparatus. 3,814,211, Cl. 182-14.000.

Pan, John William: *See—*
Maunsell, Henry Ian Geoffery; Millard, John Brennan; Pan, John William; and Schottle, John Jeffrey, 3,815,042.

Paper Converting Machine Co., Inc.: *See—*
Nystrand, Ernst Daniel; and McIntosh, Brian H., 3,814,100.

Pappas, William S., to United States of America, Atomic Energy Commission. Method for monitoring an aqueous stream for the presence of fluorocarbons. 3,814,587, Cl. 23-239.00m.

Papst-Motoren KG: *See—*
Burghacher, Martin, 3,814,960.

Paraskos, John A.: *See—*
McKinney, Joel D.; and Paraskos, John A., 3,814,681.

Parke, Davis & Company: *See—*
Kuroda, Toyoaki; and Shimizu, Toyokazu, 3,814,931.

Parker, Jeffrey M.; Dawson, Edward C.; and Kramer, Anthony J., to United States of America, Air Force. Self normalizing spectrum analyzer and signal detector. 3,815,032, Cl. 328-167.000.

Parker, John A.; Dimeff, John; and Heimbuch, Alvin H., to United States of America, National Aeronautics and Space Administration. Chromato-fluorographic drug detector. 3,814,939, Cl. 250-373.000.

Parker, Louis W.: *See—*
Jamieson, Joseph, 3,815,001.

Parker, Norman W., to Motorola, Inc. Multiplex system employing multiple quadrature subcarriers. 3,814,858, Cl. 179-15.0bt.

Parker-Hannifin Corporation: *See—*
Reinicke, Robert H., 3,814,376.

Parks, Howard Lee, to Bunker Ramo Corporation. Method employing precision stamping for fabricating the wafers of a multiwafer electrical circuit structure. 3,813,773, Cl. 29-630.00r.

Parris, Joseph N., to PPG Industries, Inc. Pressure molding of glass articles apparatus. 3,814,593, Cl. 65-305.000.

Parsons, George B.: *See—*
Weill, Robert L.; and Parsons, George B., 3,814,655.

Partch, Ambrose H.: *See—*
Fuller, Harry S.; and Partch, Ambrose H., 3,813,859.

Parussel, Horst, to Cass International GmbH. Heat exchanger. 3,814,178, Cl. 165-158.000.

Patel Jayantilal Mohanbhai: *See—*
Lubsen, Timothy Andrew; Patel Jayantilal Mohanbhai; and Cody, Robert Autand, 3,814,826.

Patel, Lallubhai O.: *See—*
Holtey, Thomas O.; and Patel, Lallubhai O., 3,815,103.

Patelli, Bianca: *See—*
Bernardi, Luigi; Patelli, Bianca; and Temperilli, Aldemio, 3,814,765.

Patterson, Charles T.: *See—*
Hill, Ernest C.; and Patterson, Charles T., 3,813,855.

Patton, Edward Donald. Pipe tool. 3,814,109, Cl. 131-243.000.

Paul, Lawrence Gerald. Apparatus for adjusting the tension of an elongated stretched filament. 3,813,983, Cl. 84-458.000.

Paul, Robert C.: *See—*
Reich, Wendell L.; and Paul, Robert C., 3,814,194.

Paul, Roy A.: *See—*
Geist, Jacob M.; Paul, Roy A.; and Thorogood, Robert M., 3,814,397.

Pavena A.G.: *See—*
Naegeli, Warner, 3,814,660.

Paymaster Corporation, The: *See—*
Gopperton, Ardath A., 3,815,117.

Peach, John B.; and McEachnie, William E., to United States of America, Army. Connector adapter device. 3,814,837, Cl. 174-88.00r.

Peake, Charles C.; and Bolan, Harry H., to Westinghouse Electric Corporation. Tube clamp. 3,813,749, Cl. 29-202.00r.

Pearson, William Robert: *See—*
Robrbaugh, Donald G.; Petersen, Everett James, Jr.; Chase, Charles Peter; and Pearson, William Robert, 3,814,582.

Pease, Logan L., to Eaton Corporation. Retroreflective addressing technique. 3,815,084, Cl. 340-23.000.

Pecher, Wolfgang; and Schottner, Helmut, to Metz Apparatewerke INH. Paul Metz. Electronic flash unit having protective circuit for flash terminating switch. 3,814,985, Cl. 315-241.00p.

Peckels, Donald R.: *See—*
Hoey, George B.; Peckels, Donald R.; and Wiegert, Philip E., 3,814,769.

Pelly, Brian R.: *See—*
Clemente, Stefano; and Pelly, Brian R., 3,815,002.

Pendleton, Kenneth L., to Universal Sales Engineering, Inc. Adaptive fixture for leak testing of containers. 3,813,923, Cl. 73-49.200.

Peng, Stephen C.: *See—*
Maker, David L.; Peng, Stephen C.; and Vos, Arend W. D., 3,814,720.
Maker, David L., 3,814,721.

Pennwalt Corporation: *See—*
Cox, Robert James, 3,814,789.
Whitaker, Reginald L.; and Smith, Herbert Q., 3,814,774.

Pepper, William B., Jr.; and Buxton, Robert J., to United States of America, Atomic Energy Commission. Destructible parachute. 3,814,355, Cl. 244-145.000.

Perkins, Garry R., to Spotnails, Inc. Fasteners and method of manufacture thereof. 3,813,985, Cl. 85-49.000.

Perry, Richard A.: *See—*
Rachor, Donald G.; and Perry, Richard A., 3,814,685.

Pervel Industries, Inc.: *See—*
Anderson, Albert E., 3,814,644.

Peter, Alfred O., to FMC Corporation. Pusher pawl mechanism for power and free conveyor system. 3,814,024, Cl. 104-172.00s.

Petersen, Everett James, Jr.: *See—*
Robrbaugh, Donald G.; Petersen, Everett James, Jr.; Chase, Charles Peter; and Pearson, William Robert, 3,814,582.

Petrella, Robert G.: *See—*
Green, Harold A.; and Petrella, Robert G., 3,814,764.

Pettingell, John S.: *See—*
Palmieri, Frederick W.; and Pettingell, John S., 3,814,910.

Pfizer Inc.: *See—*
Cronin, Timothy H.; and Hess, Hans-Jurgen E., 3,814,760.
Cross, Peter Edward; and Dickinson, Roger Peter, 3,814,750.
Hess, Hans-Jurgen E.; and Nelson, Roger P., 3,814,766.

Philco-Ford Corporation: *See—*
Rootsey, James V., 3,815,136.

Philippe, Jean B., to Ferlux. Ortho-amino benxoyl hydrazine derivatives and process for prepaing the same. 3,814,772, Cl. 260-293.770.

Phillips, David T.; Brooks, Herman H.; Wyatt, Philip J.; and Liu, Chelcie B., to Science Spectrum, Inc. Levitator. 3,815,000, Cl. 317-262.00e.

Phillips, Melvin C.: *See—*
Johnson, Robert H.; and Phillips, Melvin C., 3,815,114.

Physio-Control Corporation: *See—*
Howard, Jack D.; Seiffert, Stanley V.; and Wartes, Christopher R., 3,814,105.

Piber, Earl T., to Cutler-Hammer, Inc. Miniature electrical reversing switch mounted on trigger operated switch for hand-held tools. 3,814,886, Cl. 200-157.000.

Picker Corporation: *See—*
Martone, Ronald J.; Goldman, Samuel C.; and Wolczek, Walter, 3,814,938.

Pierson, James A.: *See—*
Blood, Ernest R.; Lichti, Robert W.; and Pierson, James A., 3,814,269.

Piggy-Back Trailer Rental Limited and Gordon: *See—*
Wardill, Gordon Agar; Taube, David Carl; and Cornell, Alan Ananias, 3,814,464.

Pilkington P.E. Limited: *See—*
Freeman, Michael Horold, 3,814,508.

Pillard, Marcel T.: *See—*
Guigues, Frederic; and Pillard, Marcel T., 3,814,570.

Pillsbury Company, The: *See—*
Morgan, Jay E., 3,814,819.

Pioneer Electronic Corporation: *See—*
Ito, Hideo, 3,814,988.

Pioneer Magnetics, Inc.: *See—*
Berger, James K., 3,815,009.

Pisatowski, Albert J., to Westinghouse Electric Corporation. Elevator speed sensor. 3,814,216, Cl. 187-29.00r.

Pissiotas, Georg: *See—*
Martin, Henry; and Pissiotas, Georg, 3,814,801.

Pittman, Allen G.; Wasley, William L.; and Jones, Carloton C., to United States of America, Agriculture. Treatment of textiles with glycidol-modified polyurethanes. 3,814,578, Cl. 8.127.600.

Plasti-Vac, Inc.: *See—*
Diamond, Harvey J., 3,814,562.

Plastic Materials Systems, Inc.: *See—*
Guglietti, Henry G., 3,814,386.

Plastique, Astra: *See—*
Bereziat, Andre, 3,814,273.

Plated wire memory element: *See—*
Holmen, James O.; and Ulmer, Robert P., 3,814,591.

Plesich, Marion F.: *See—*
Kowalski, Edward W.; and Plesich, Marion F., 3,814,716.

Plessey Handel und Investment A.G.: *See—*
Repton, Charles Samuel; Venton, Peter Charles; and Hodges, Kenneth James Hamer, 3,814,919.

Plunk, Troy E.; and Moran, Robert L., to Raytheon Company. Microwave power divider. 3,815,055, Cl. 333-9.000.

Plunkett, Joseph A., to Recognition Equipment Incorporated. Method and apparatus for item tracking. 3,815,102, Cl. 340-172.500.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Cahour, Maurice Alphonse Jules; Le Trung, Truc; and Signoret, Lucien Gaston, 3,814,565.

Podell, David L., Jr.; and Podell, Howard I. Surgical glove. 3,813,695, Cl. 2-168.000.

Podell, Howard I.: *See—*
Podell, David L., Jr.; and Podell, Howard I., 3,813,695.

Podsuweit, Klaus; and Feldor, Winfried, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Fuel-supply control for automotive transmissions and the like. 3,814,224, Cl. 192-.084.

Poe, Richard J.: *See—*
May, Paul L.; and Poe, Richard J., 3,815,125.

Poggiali, Lewis D.: *See—*
Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., 3,813,844.
Coons, Everett A.; Poggiali, Lewis D.; and Jacalone, Richard P., 3,814,302.

Polaroid Corporation: *See—*
Cook, Gerald H., 3,814,344.
Magerman, Leonard S., 3,814,872.

Pollmeier, Franz-Josef; and Muller, Paul, to Siemens Aktiengesellschaft. Electrical fuse. 3,815,073, Cl. 337-295.000.

Polyvend, Inc.: *See—*
Stoltz, James P.; Bruckner, James V.; and Yingst, Thomas O., 3,814,282.

Pont-A-Mousson S.A.: *See—*
Royer, Alain Louis Albert, 3,814,168.

Popov, Anton Dimitrov: *See—*
Stanchev, Ivan Tenev; Popov, Anton Dimitrov; and Varbanov, Ivan Varbanov, 3,814,010.

Popovici, Mihail C.: *See—*
Gardner, Thomas E.; and Popovici, Mihail C., 3,815,097.

Porret, Daniel: *See—*
Habermeier, Juergen; and Porret, Daniel, 3,814,775.

Porta Systems Corporation: *See—*
DeLuca, Paul V., 3,814,869.

Portec, Inc.: *See—*
Steltz, Douglas C., 3,814,295.

Porter, H. K., Company, Inc.: *See—*
Weston, Donald E.; and Kupetis, Raymond F., 3,814,878.

Portmann, Hubert, to Compagnie des Montres Longines Francillon S.A. Direct voltage converter, particularly for use in time measuring instruments. 3,815,007, Cl. 321-2.000.

Pospisil, Richard E.: *See—*
Lubarsky, Andra, Jr.; and Pospisil, Richard E., 3,814,839.

Potter, Ernest William: *See—*
Allen, Ronald Noel; and Potter, Ernest William, 3,814,184.

Pouillot, Bernard: *See—*
Gallois, Daniel J., 3,814,605.

Powell, Ann Joyce. Child's clothes bag holder. 3,814,359, Cl. 248-99.000.

Powell, Charles W., to Knotex Maschinenbau G.m.b.H. Window box and mounting therefor. 3,813,813, Cl. 47-36.000.

Powell, Leslie Vernon; and Edwards, Reginald Harold, to Dunlop Holdings Limited. Pneumatic tire. 3,814,161, Cl. 152-352.000.

PPG Industries, Inc.: *See—*
Hudson, Ben Avery, 3,814,339.
Nalley, Charles E.; and Lovelace, Joseph B., 3,814,715.
Parris, Joseph N., 3,814,593.
06/04/74; and Creasey, Jack R., 3,814,160.

Prasse, Herbert F., to Ramsey Corporation. Prepositioned and gap aligned split piston ring assemblies. 3,814,409, Cl. 267-1.500.

Prasse, Herbert F.; and McCormick, Harold E., to Ramsey Corporation. Sealing element for use in internal combustion engines. 3,814,447, Cl. 277-224.000.

Preisler, Frank: *See—*
Hibbing, Edwin Ernst; and Preisler, Frank, 3,813,977.

Preston, Edward G.: *See—*
Labbe, Francis A. M.; Preston, Edward G.; Hodsall, Brian; and Marritt, Clifford R., 3,813,996.

Preston, Francis R.: *See—*
Kraft, Sidney; and Preston, Francis R., 3,815,026.

Price, Philip A., 1/2 to Jordan, Joseph P. Tool holder. 3,813,746, Cl. 29-96.000.

Price, Richard J. Radio navigation plotter. 3,813,783, Cl. 33-1.0sd.

Price, Warren H.; and Hochwitz, Lynn E., to Gilson Bros. Co. Friction drive with axially spaced disks and intermediate shiftable wheel. 3,813,954, Cl. 74-194.000.

Priestley, Joseph A.: *See—*
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Priestley, Joseph A., 3,813,698.

Prince, Arthur E., Jr.; and Burns, Kenneth S., to Celanese Corporation. Process for drying crimped polybenzimidazole continuous filamentary materials employing microwave drying. 3,814,793, Cl. 264-210.00z.

Prince, Arthur E., Jr., to Celanese Corporation. Thermal process for removing solvent from polybenzimidazole continuous filamentary materials. 3,814,794, Cl. 264-210.00f.

Prince, Martin; Blanck, Hillard; and Tarancon, Gregorio, to Saleen Development Corporation. Removal of particulate matter from gaseous wastes by wet collectors. 3,814,615, Cl. 106-213.000.

Pringle, Anthony, to Honeywell Invormation Systems Inc. Scanning Technique for mulitplexer apparatus. 3,814,860, Cl. 179-15.0ba.

Prinzhorn, Kaus; and Hein, Dieter, to Kabel-und Metallwerke Gutehoffnungshuette A.G. Method of manufacturing tubular electromagnetic wave guides. 3,813,765, Cl. 29-600.000.

Probber, Harvey: *See—*
Kastholm, Jorgen; and Probber, Harvey, 3,814,369.

Process for producing a photolithographic printing plate: *See—*
Shinozaki, Fumiaki; Ikeda, Tomoaki; Makaida, Yoshito; and Tsuboi, Masayoshi, 3,814,602.

Procter & Gamble Company: *See—*
Lubsen, Timothy Andrew; Patel Jayantilal Mohanbhai; and Cody, Robert Autand, 3,814,826.

Procter & Gamble Company, The: *See—*
Bedenk, William T.; and Purves, Edward R., 3,814,824.
Yang, Jih Hsin; and Olsen, Robert A., 3,814,823.

Prodelin, Inc.: *See—*
Lewis, Robert F.; and Nelson, James W., 3,815,139.

Products Engineering, Inc.: *See—*
Davis, George Bradley, Jr., 3,813,834.

Progil: *See—*
Bourdon, Louis; Simon, Etienne; Borrel, Philippe; and Lehureau, Jean, 3,814,702.

Programming Technologies, Inc.: *See—*
Bennett, William P.; and Haller, Jacob, 3,814,343.

Prohofsky, LeRoy A., to Sperry Rand Corporation. Method of forming a tunnel structure for a magnetic plated-wire memory array. 3,813,768, Cl. 29-604.000.

Pruckmayr, Gerfried: *See—*
Martinez, Boni Philip; and Pruckmayr, Gerfried, 3,814,623.

Pruckmayr, Gerfried, to Du Pont de Nemours, E. I., and Company. Method for imparting durable press properties to cellulosic fabrics. 3,814,580, Cl. 8-186.000.

Publishers Paper Co.: *See—*
Rand, Douglas R.; linney, Richard D.; Woods, Charles R.; and Smith, Edward M., 3,813,980.

Pullman Incorporated: *See—*
McNally, George S.; and Sims, Roger D., 3,814,029.
Nagy, Ernest J., 3,813,814.
Vornberger, George F., 3,814,479.

Pullman Transport Leasing Company: *See—*
Adler, Franklin P., 3,814,028.

Purex Corporation, Ltd.: *See—*
Pacini, August J., 3,814,804.

Purves, Edward R.: *See—*
Bedenk, William T.; and Purves, Edward R., 3,814,824.

Purviance, Billy Joe. Apparatus for laying sub-surface irrigation pipe. 3,813,888, Cl. 61-72.600.

Puster, Louis M.; Lewis, Jay L.; and Brakebill, Harold G., to Robertshaw Controls Company. Fluid control system and method of operating the same. 3,814,311, Cl. 236-47.000.

Pyke, Thomas R.: *See—*
Argoudelis, Alexander D.; Bergy, Malcolm E.; and Pyke, Thomas R., 3,814,796.

Quaker Oats Company, The: *See—*
Brown, Lloyd H.; and Stephans, Larry C., 3,814,626.
Henthorn, Larry J.; and Kincs, Frank R., 3,814,822.

Quinn, Robert M.: *See—*
Kump, Herbert J.; Lambert, Lloyd M., Jr.; and Quinn, Robert M., 3,814,992.

Quitmann, Walter: *See—*
Meyer, Walter; and Quitmann, Walter, 3,814,646.

Rabow, Gerald, to International Telephone and Telegraph Corporation. Maximum-likelihood detection system. 3,815,028, Cl. 325-304.000.

Rachor, Donald G.; and Perry, Richard A., to United States of America, Environmental Protection. Removal of mercury from mercury catholde sludge. 3,814,685, Cl. 210-59.000.

Rackus, John Joseph; Skilbeck, John Paul; and Szkudlapski, Alfons Henryk, to Western Electric Company, Incorporated. Nonuniformly treating articles and supporting them therefor. 3,814,117, Cl. 134-158.000.

Radio Corporation of America: *See—*
Freedman, Norman S.; Horsting, Carle W.; Lawrence, Walter F.; and Carrona, John J., 3,814,633.

Radke, Arthur O., to Universal Oil Products Company. Plastic tambour door. 3,814,493, Cl. 312-297.000.

Radtke, Charles Stephan: *See—*

La Croce, Leonard Thomas; and Radtke, Charles Stephan, 3,814,277.

Rain Jet Corp.: *See—*
Hruby, John O., Jr., 3,814,317.

Rainier Companies, Inc., The: *See—*
Vacano, Nickolas Lothar, 3,814,003.

Ramex Company: *See—*
Moe, Lowell A., 3,813,918.

Ramsey Corporation: *See—*
Prasse, Herbert F., 3,814,409.
Prasse, Herbert F.; and McCormick, Harold E., 3,814,447.

Ramsey, James E., Jr.; and Griffin, Auburn K., Jr., to Westinghouse Electric Corporation. Detachable potential indicator circuit assembly for induction watthour meters. 3,815,027, Cl. 324-137.000.

Ramstetter, Rudolf, to American Manufacturing Company. Digital timer with resetting mechanism. 3,814,309, Cl. 235-130.00r.

Rand, Douglas R.; Iinney, Richard D.; Woods, Charles R.; and Smith, Edward M., to Publishers Paper Co. Trimming apparatus. 3,813,980, Cl. 83-467.000.

Rasheev, Gueorgui Nikolov: *See—*
Nikolov, Ivan Dimov; Rasheev, Gueorgui Nikolov; Sivov, Ferdo Atanasov; Nikolov, Nikolai Yonkov; and Hristov, Chavdar Asenov, 3,814,127.

Rasmussen, Lester M. Cup holder for automobile. 3,814,367, Cl. 248-311.000.

Rawson, Edward B.: *See—*
Winchester, John E.; and Rawson, Edward B., 3,815,100.

Raygo, Inc.: *See—*
Barrett, John C.; and Larson, Roger L., 3,814,532.

Raymond, Edward A. Orthopedic boot. 3,814,088, Cl. 128-87.00r.

Raynolds Metals Company: *See—*
Bylund, Linton D., 3,814,590.

Raytheon Company: *See—*
Meyer, Paul C.; and Schulz, Manfred B., 3,815,056.
Plunk, Troy E.; and Moran, Robert L., 3,815,055.
Robbins, Frederick L., Jr.; and Suprenant, Paul J., 3,813,946.

Rayzal, Jean Francois, to Etablissements J.J. Carnaud & Forges de Basseindre. Lid for metal can and the like, particularly food can. 3,814,279, Cl. 220-66.000.

RCA Corporation: *See—*
Haferl, Peter Eduard, 3,814,980.
McClure, Donald Avery; and Nichols, Harvey Clay, 3,815,054.
Russell, John Patrick; and Greenaway, David Leslie, 3,814,904.
Schindler, Henry Claude, 3,814,501.
Steckler, Steven Alan, 3,815,051.
Wheatley, Carl Franklin, Jr., 3,815,037.

Reade, Graham Melvin, to Imperial Chemical Industries Limited. Heat stabilization of oriented thermoplastic films. 3,814,785, Cl. 264-89.000.

Reboul, Jean Philippe, to Thomson-CSF. Gas-discharge display panels. 3,814,970, Cl. 313-221.000.

Recognition Equipment Incorporated: *See—*
Plunkett, Joseph A., 3,815,102.

Redd, Michael Eugene; and Rieke, Robert Clyde, to Weyerhaeuser Company. Method of making end rings for cylindrical containers. 3,814,041, Cl. 113-121.00c.

Reddy, Boyapalle R.: *See—*
Chang, Stephen S.; and Reddy, Boyapalle R., 3,814,818.

Redetzky, Wolfgang: *See—*
Hartmann, Peter; Redetzky, Wolfgang; Roos, Ernst; and Kempermann, Theo, 3,814,727.

Reed, Robert D.: *See—*
Zink, John Smith; Reed, Robert D.; and Goodnight, Hershel E., 3,814,567.

Reed Tool Company, mesne: *See—*
Reich, Wendell L.; and Paul, Robert C., 3,814,194.

Reed, Willard H.: *See—*
Masters, Cardinal M.; Reed, Willard H.; and Wentzell, Ralph H., 3,813,797.

Reese, Lewis E., to Drake, Oldrich. Landing wheel rotating device for aircraft. 3,814,354, Cl. 244-103.00s.

Regie National des Usines Renault: *See—*
Roger, Yves, 3,813,909.

Regie Nationale des Usines Renault: *See—*
Bonnaud, Michel, 3,813,894.
Lombard, Claude Edmond; Labaune, Camille; and Neubauer, Pierre, 3,815,010.

Reich, Wendell L.; and Paul, Robert C., to Reed Tool Company, mesne. Earth drilling apparatus. 3,814,194, Cl. 173-152.000.

Reid, Raymond R.; and Lanpheer, Richard A., to Brunswick Corporation. Exhaust tuning system for two-stroke engines. 3,813,880, Cl. 60-314.000.

Reilly, William: *See—*
Gabriel, James M.; and Reilly, William, 3,814,598.

Reinberg, Alan R.; and Fish, John G., to Texas Instruments Incorporated. Process of fabricating silicon photomask. 3,814,641, Cl. 156-11.000.

Reinicke, Robert H., to Parker-Hannifin Corporation. Solenoid operated valve with magnetic latch. 3,814,376, Cl. 251-65.000.

Reinmetall GmbH, Firma: *See—*
Kaltmann, Hans-Joachim, 3,813,790.

Reinsch, Herbert; and Riedel, Wolfgang, to Bosch, Robert, Photokino GmbH. Operating means for motion pictures projectors or the like. 3,814,512, Cl. 352-178.000.

Reising, Flavian, Jr.: *See—*
Swin, William A.; and Reising, Flavian, Jr., 3,815,015.

Reiter, Eugene A.: *See—*
Friend, William H.; Natof, Stuart L.; Reiter, Eugene A.; and Eudman, David W., 3,813,999.

Reliable Electric Company: *See—*
Japenga, Ronald, 3,814,866.

Relton Corporation: *See—*
Kinard, William C., 3,814,263.

Remy, E. P., et cie: *See—*
Dardaine, Edgar; and Berry, Jean-Luc, 3,814,783.

Rennick, Lyle V.; and Mitchael, William L., to Northrop Corporation. Apparatus for precisely indicating position of rotational machinery. 3,813,931, Cl. 73-116.000.

Repco Research Pty. Ltd.: *See—*
Brock, Alan James, 3,814,517.

Repton, Charles Samuel; Venton, Peter Charles; and Hodges, Kenneth James Hamer, to Plessey Handel und Investment A.G. Fault detection and isolation in a data processing system. 3,814,919, Cl. 235-153.0ak.

Research Corporation: *See—*
Chang, Stephen S.; and Reddy, Boyapalle R., 3,814,818.
Clark, Edward L., 3,814,478.

Research Institute for Iron, Steel and other Metals of the Tohoku University, The: *See—*
Tanaka, Eihachiro; Onodera, Yutaka; Fukuda, Takeji; Yamashita, Tsutomu; and Kuma, Shoji, 3,813,764.

Reticon Corporation: *See—*
Snow, Edward H., 3,814,846.

Reunanen, Matti. Method and apparatus for removing undersirable soluble substances from chemical compositions. 3,814,581, Cl. 23-230.00r.

Reuter, Alfred, to Gebruder Linck. Tool heads for use in machining timber. 3,814,155, Cl. 144-219.000.

Reynolds Metals Company: *See—*
Adams, harold W., 3,813,772.
Shockley, Gilbert R.; and Hafer, Richard F., 3,814,423.

Rheinmetall GmbH: *See—*
Backstein, Gunter; and Spath, Frank-Volker, 3,814,017.

Rhodes, Charles K.: *See—*
Carman, Robert L., Jr.; and Rhodes, Charles K., 3,815,043.

Rhody, Howard A. Concealed tie down anchor. 3,814,461, Cl. 280-179.00r.

Rice, Edward K. Modular multiple story structure and module therefor. 3,813,835, Cl. 52-227.000.

Rich, Dennis E., to Honeywell Information Systems, Inc. Apparatus and method for gauging the shear of circuit boards to size. 3,813,979, Cl. 83-467.000.

Rich, Theodore A., to Environment/One Corporation. Expansion apparatus for condensation nuclei monitor. 3,813,991, Cl. 91-31.000.

Richardson-Merrell Inc.: *See—*
Andrews, Edwin R.; and Horgan, Stephen W., 3,814,770.

Ricoh Co., Ltd.: *See—*
Maruyama, Shoji; Kojima, Katue; Kubota, Tomio; and Ohta, Masafumi, 3,814,752.

Ridder, Gerhard: *See—*
Hiersig, Heinz M.; Hansgen, Klaus; Ridder, Gerhard; and Sudhoff, Wolfgang, 3,813,897.

Rideout, Gerald E.: *See—*
Samuelian, Maurice P., Sr.; and Rideout, Gerald E., 3,814,360.

Riedel, Wolfgang: *See—*
Reinsch, Herbert; and Riedel, Wolfgang, 3,814,512.

Riehl, Fred, to Robertshaw Controls Company. Snorkel tube burner construction and method of making the same. 3,814,077, Cl. 126-39.00e.

Rieke, Robert Clyde: *See—*
Redd, Michael Eugene; and Rieke, Robert Clyde, 3,814,041.

Rigsby, Burl K.: *See—*
Rigsby, Thayer B.; and Rigsby, Burl K., 3,813,756.

Rigsby, Thayer B.; and Rigsby, Burl K. Method of removing and replacing split ring shaft locks. 3,813,756, Cl. 29-427.000.

Riley, Colin Charles: *See—*
Heap, Harry Rodney; and Riley, Colin Charles, 3,813,759.

Rinker, Carl G., to Atwater Strong Co., Inc. Vacuum cleaner construction. 3,813,725, Cl. 15-347.000.

Ritchie, De W. Adaptable support for use on uneven surfaces. 3,814,362, Cl. 248-188.300.

Ritter, Gerhard: *See—*
Gott, Hans; Ritter, Klaus; Ritter, Josef; and Ritter, Gerhard, 3,814,145.

Ritter, Helmut, to Heberlein & Co. AG. Apparatus and process for continuously texturing and post-setting yarns. 3,813,863, Cl. 57-34.0hs.

Ritter, Josef: *See—*
Gott, Hans; Ritter, Klaus; Ritter, Josef; and Ritter, Gerhard, 3,814,145.

Ritter, Klaus: *See—*
Gott, Hans; Ritter, Klaus; Ritter, Josef; and Ritter, Gerhard, 3,814,145.

Ritter, Ronald: *See—*
Kanefield, Bryan H.; and Ritter, Ronald, 3,814,425.

Ritz, Wilhelm: *See—*
Slabon, Siegfried; Kasten, Ludwig; and Ritz, Wilhelm, 3,814,475.

Robbins, Frederick L., Jr.; and Suprenant, Paul J., to Raytheon Company. Temperature compensating circuit. 3,813,946, Cl. 73-430.000.

Robbins, John E., to USM Corporation. Multiple component mixing device. 3,814,289, Cl. 222-135.000.

Robbins, Samuel B., to General Motors Corporation. Vehicle multiplex circuit having function priority. 3,814,861, Cl. 179-15.00a.

Roberts, Edward J. Apparatus for storing dental floss and for holding dental floss during use. 3,814,114, Cl. 132-92.00r.

Roberts, Richard J.; and Kamberg, Eduard F., to Aqua-Not, Inc. Battery-powered auxiliary sump pump. 3,814,544, Cl. 417-40.000.

Roberts, Robert L. Key operated switching apparatus. 3,814,873, Cl. 200-44.000.

Roberts, Thomas A.: *See—*
Greenwood, Roger; and Roberts, Thomas A., 3,814,132.

Robertshaw Controls Company: *See—*
Demi, Roy C., 3,814,125.
Puster, Louis M.; Lewis, Jay L.; and Brakebill, Harold G., 3,814,311.
Riehl, Fred, 3,814,077.

Robinson, Barry Samuel John, to Girling Limited. Valves for controlling the flow of hydraulic fluids. 3,814,485, Cl. 303-50.000.

Robinson, Frank: *See—*
Betts, Max William; and Robinson, Frank, 3,813,901.

Robinson, Harry J. Board game apparatus. 3,814,434, Cl. 273-134.00g.

Robinson, Thomas C.: *See—*
Kitrilakis, Sotiris; and Robinson, Thomas C., 3,814,547.

Robrbaugh, Donald G.; Petersen, Everett James, Jr.; Chase, Charles Peter; and Pearson, William Robert, to Beckman Instruments, Inc. Automated chemical analyser system. 3,814,582, Cl. 23-230.00r.

Rockwell International Corporation: *See—*
Case, Robert O., Jr.; and Page, Jerome M., 3,815,132.

Rodgers, Aubrey, to United States of America, Army. Light actuated solid state pickoff. 3,813,949, Cl. 74-5.60a.

Roesch, George R.: *See—*
Highberg, Carle W.; and Roesch, George R., 3,813,820.

Roffman, Gary L.: *See—*
Talkin, Albert I.; Toda, Kenji; and Roffman, Gary L., 3,813,920.

Roger, Yves, to Regie National des Usines Renault and Automobiles Peugeot. Methods of extruding helical gear blanks. 3,813,909, Cl. 72-95.000.

Rohm and Haas Company: *See—*
Eckfeldt, John H., 3,814,803.

Rohm, Fritz: *See—*
Ahrens, Wilhelm; Lea, Hans; Rohm, Fritz; and Straehle, Heinz, 3,814,387..

Rohm, Gunter Horst. Multiple-jaw-chuck. 3,814,451, Cl. 279-121.000.

Roller, Paul S. Method and apparatus for saline water conversion. 3,814,671, Cl. 203-7.000.

Romagnoli, Andrea, to Industria Macchine Automatiche S.p.A. Incoherent product volumetric batching device for high speed packaging machines. 3,813,848, Cl. 53-178.000.

Rombach, Frank; and Venlet, Cornelis N., to Nordson Corporation. Powder spray booth. 3,814,002, Cl. 98-115.0sb.

Ronning Engineering Co., Inc.: *See—*
Ronning, Richard L., 3,814,331.

Ronning, Richard L., to Ronning Engineering Co., Inc. Method of processing crops in a closed loop system under negative pressure. 3,814,331, Cl. 241-19.000.

Rontgen, Peter, to Isoliertechnik Horst Grassmann. Steel spring insulator. 3,814,357, Cl. 248-20.000.

Rood, William R., to Keene Corporation. Bearing assembly. 3,814,488, Cl. 308-227.000.

Roos, Ernst: *See—*
Hartmann, Peter; Redetzky, Wolfgang; Roos, Ernst; and Kempermann, Theo, 3,814,727.

Roos, Gerold: *See—*
Kleindienst, Horst; Roos, Gerold; and Zingg, Rudolf, 3,813,930.

Rootsey, James V., to Philco-Ford Corporation. Coaxial tracking signal coupler for antenna feed horn. 3,815,136, Cl. 343-117.000.

Rose, Ervin W. Tubular track marble game apparatus. 3,814,432, Cl. 273-123.00r.

Rosenbauer, Gerhard: *See—*
Irnich, Werner; and Rosenbauer, Gerhard, 3,814,104.

Rossitto, Vincent E.: *See—*
Kruger, Jean J.; and Rossitto, Vincent E., 3,813,887.

Roth, Howard: *See—*
Smadar, Yechiel; Roth, Howard; McCarthy, John P.; and Moyer, John, 3,814,560.

Rotomors S.r.L.: *See—*
Bertorello, Mario, 3,814,450.

Royal Appliance Manufacturing Co., Inc.: *See—*
Melreit, Robert V., 3,814,399.

Royer, Alain Louis Albert, to Pont-A-Mousson S.A. Method for the centrifugal production of metal tubes. 3,814,168, Cl. 164-114.000.

Rudat, Emil A.; and Medler, Edwin J., to Innovations Incorporated. C-frame structural module. 3,814,033, Cl. 108-108.000.

Rufer, Clemens; Albrecht, Rudolf; Dessler, Hans-Joachim; and Schroder, Eberhard, to Schering Aktiengesellschaft. 5-Nitroimidazoles as antimicrobial agents. 3,814,810, Cl. 424-248.000.

Ruger, William B., to Sturm, Ruger & Co., Inc. Revolver crane latch. 3,813,804, Cl. 42-62.000.

Runge, Donald G.: *See—*
Charles, Malcolm Jean; and Runge, Donald G., 3,814,163.

Rupp, Warren, Company, The: *See—*
Rupp, Warren E., 3,814,548.

Rupp, Warren E., to Rupp, Warren, Company, The. Diaphragm pump apparatus. 3,814,548, Cl. 417-395.000.

Ruppa, Aaro Arvo. Fishing rod. 3,813,807, Cl. 43-15.000.

Rushton, Harold; and Blackledge, Keith, to British Leyland Truck and Bus Division, Limited. Rack and pinion steering gear. 3,814,202, Cl. 180-79.20r.

Rusk, George R., to Warwick Electronics Inc. Horizontal centering circuit. 3,814,981, Cl. 315-2t.0td.

Russell, John Patrick; and Greenaway, David Leslie, to RCA Corporation. Cryptographically coded cards employing synthetic light modifying portion. 3,814,904, Cl. 235-61.11e.

Ryckman, William D., Jr.: *See—*
Gordon, Walter H., Jr.; and Ryckman, William D., Jr., 3,814,899.

Ryder, John Charles, to Firestone Tire & Rubber Company, The. Run flat device for tires. 3,814,158, Cl. 152-158.000.

Ryder, John Lee: *See—*
Harris, Peter John; Holmes, Barry Stanford; and Ryder, John Lee, 3,814,177.

Ryntz, Edward F., Jr.; Janowak, John F.; and Watton, John F., to General Motors Corporation. Molten metal sampling device. 3,813,944, Cl. 73-354.000.

S. & E. Strauss Limited: *See—*
Beet, Roy; and Skinner, Barry, 3,813,738.

S.A. Des Anciens Etablissements Paul Wurth: *See—*
Legille, Edouard, 3,814,403.

Safiuddin, Mohammed; and Morrison, Gary L., to Westinghouse Electric Corporation. Static inertia compensation function generator. 3,814,310, Cl. 235-197.000.

Sahara, Masayoshi: *See—*
Yata, Kotaro; Nanba, Yasuhiro; and Sahara, Masayoshi, 3,815,148.

Sain, William H., to Varian Associates. Triode electron tube with segmented cathode and vane grid. 3,814,972, Cl. 313-296.000.

Saito, Kazuo: *See—*
Nagoshi, Fumiya; Arakawa, Hideyuki; and Saito, Kazuo, 3,814,708.

Sakai, Sukeyoshi: *See—*
Sasaki, Hajime; Yamagishi, Kazuo; Sakai, Sukeyoshi; and Hoshi, Toshihiro, 3,813,767.

Sakuma, Tadashi: *See—*
Nakagawa, Yasuichi; and Sakuma, Tadashi, 3,813,872.

Sakurai, Masami; and Tsuruta, Saburou, to Tokyo Shibaura Electric Co., Ltd. Side pincushion distortion correction circuitry. 3,814,982, Cl. 315-27.0gd.

Salad Supreme Incorporated: *See—*
Busta, Francis F.; and Brooks, Irving M., 3,814,820.

Saleen Development Corporation: *See—*
Prince, Martin; Blanck, Hillard; and Tarancon, Gregorio, 3,814,615.

Sallo, Richard L.; and Stricker, Charles D., to United States Steel Corporation. Method for the production of extra-high strength galvanized wire. 3,814,675, Cl. 204-145.00r.

Salomon, Georges Pierre Joseph. Apparatus for compensating for the longitudinal movement of a safety ski binding. 3,814,455, Cl. 280-11.35t.

Salyer, Ivan O.: *See—*
Schwendeman, James L.; and Salyer, Ivan O., 3,814,808.

Samson Apparatebau AG: *See—*
Klee, Gerhard, 3,814,126.

Samuelian, Maurice P., Sr.; and Rideout, Gerald E., to General Signal Corporation. Bowl supporting turntable for kitchen mixer. 3,814,360, Cl. 248-131.000.

Sangamo Electric Company: *See—*
Finlay, Alexander, Jr.; Dyer, Robert E.; and Kessler, William D., 3,815,119.

Santen, Salomon, to Stork Amsterdam N.V. Device for treating container-packed wares and conveying unit for such a device. 3,814,234, Cl. 198-143.000.

Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., to American Home Products Corporation. (2-Pyrimidinylthio)alkanoic acids, esters, amides and hydrazides. 3,814,761, Cl. 260-356.50r.

Santilli, Arthur A., to Kim, Dong H. and American Home Products Corporation. 4-Thiosemicarbazido-5-pyrimidinecarboxylic acid alkyl esters. 3,814,762, Cl. 260-256.50r.

Sanymetil Products Co., Inc., The: *See—*
Dielman, Harold J., 3,813,836.

Sapienza, James J., to General Electric Company. Food waste disposer with outer wrapper. 3,814,333, Cl. 241-46.00b.

Sapochinik, Leon. Hair-comb cleaning device. 3,813,722, Cl. 15-104.920.

Sasaki, Hajime; Yamagishi, Kazuo; Sakai, Sukeyoshi; and Hoshi, Toshihiro, to Fujitsu Limited. Method of manufacture of annular magnetic cores. 3,813,767, Cl. 29-604.000.

Sasaki, Osamu: *See—*
Yamaoka, Takao; Sasaki, Osamu; and Yamana, Takashi, 3,814,649.

Sasaki, Yasuto: *See—*
Matsufuji, Akira; Kishikawa, Kanichi; Sasaki, Yasuto; Miyaji, Susumu; and Tutui, Fumihiro, 3,813,912.

Sater, Robert R. Portable tray support. 3,813,714, Cl. 5-332.000.

Sato, Akira: *See—*
Shiba, Keisuke; and Sato, Akira, 3,814,609.

Sato, Hitoshi: *See—*

Takahashi, Susumu; Sato, Hitoshi; and Kaneko, Yoichi, 3,814,997.

Sato, Masamichi: *See—*
Kasugai, Tsuneo; Minagawa, Nobuhiko; and Sato, Masamichi, 3,814,617.

Saunder, Kenneth D. Master-slave key. 3,813,905, Cl. 70-339.000.

Saunders-Singer, Arthur E. Microscope manipulator. 3,813,959, Cl. 74-491.000.

Scarborough, Alexander A., to Deering Milliken Research Corporation. Method for preparing dust control fabrics. 3,814,624, Cl. 117-136.000.

Schaefer, Hans F., Jr.: *See—*
Dorosz, Adolph S.; Schaefer, Hans F., Jr.; and Sprague, Gordon V., Jr., 3,814,038.

Schaefer Marine Products: *See—*
Merry, Carl Alan, 3,814,835.

Schantz, Spencer C.: *See—*
Schantz, Spencer C.; and Berry, William R. (said Berry assor. to said), 3,815,082.

Schantz, Spencer C.; and Berry, William R., said Berry assor. to said Schantz, Spencer C. Kick-out switch and buzzer. 3,815,082, Cl. 339-221.00r.

Schatz, Peter M. Aquarium cleansing apparatus. 3,814,254, Cl. 210-169.000.

Schauweker, George H.; and Dostourian, Harry, to American Optical Corporation. Buckle. 3,813,734, Cl. 24-200.000.

Schenck, Paul F.: *See—*
Dirks, Gerhard; and Schenck, Paul F., 3,815,083.

Scher, Herbert I.; Ungar, Israel S.; and McQuade, John E., Jr., to Esso Research and Engineering Company. High pressure decorative laminated with ink surface registered with embossing. 3,814,647, Cl. 156-219.000.

Schering Aktiengesellschaft: *See—*
Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, 3,814,758.
Rufer, Clemens; Albrecht, Rudolf; Dessler, Hans-Joachim; and Schroder, Eberhard, 3,814,810.

Scheu Manufacturing Company: *See—*
Darley, Reginald, 3,814,574.

Schick Incorporated: *See—*
Doyle, Edward J.; and Bartram, Nial C., 3,814,111.

Schiess Aktiengesellschaft: *See—*
Smrcek, Bruno, 3,813,824.

Schindler, Henry Claude, to RCA Corporation. Liquid-crystal display device and method of making. 3,814,501, Cl. 350-160.0lc.

Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Spooling device with pre-winding means. 3,814,338, Cl. 242-18.0pw.

Schlumberger Technology Corporation: *See—*
Urbanosky, Harold J.; and Whitten, Frank R., 3,813,936.
Young, David E., 3,814,181.

Schmidt, Erich, to Maschinenfabrik Zuckermann Komm, Ges. Wien. Apparatus for performing a series of operations on a succession of wood workpieces. 3,814,153, Cl. 144-3.00r.

Schmidt, Henry, Jr., to Industrial Filter & Pump Mfg. Co. Filter cake compression system. 3,814,257, Cl. 210-332.000.

Schmidt, Peter James, to Xomox Corporation. Method of making a coated butterfly valving member. 3,814,777, Cl. 264-40.000.

Schmit, Francis M., to Honeywell Inc. Optical memory with readout beam anneal. 3,815,151, Cl. 360-114.000.

Schmitz, Albert A.: *See—*
Jannson, Birger F.; and Schmitz, Albert A., 3,814,554.

Schneider, Irwin. Grainless photographic medium and method of making same. 3,814,601, Cl. 96-27.00e.

Schneider, Marion F.: *See—*
Ainsworth, Glenn C.; and Schneider, Marion F., 3,814,940.

Schneider, Michael. Hydraulic boring device. 3,814,193, Cl. 173-57.000.

Schon, Franz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; Meininger, Fritz; Mischke, Peter; and Schon, Franz, 3,814,579.

Schottle, John Jeffrey: *See—*
Maunsell, Henry Ian Geoffery; Millard, John Brennan; Pan, John William; and Schottle, John Jeffrey, 3,815,042.

Schottner, Helmut: *See—*
Pecher, Wolfgang; and Schottner, Helmut, 3,814,985.

Schramm, Buford J., to Everts, Robert G. Helicopter rotor blade. 3,814,540, Cl. 416-226.000.

Schroder, Eberhard: *See—*
Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, 3,814,758.
Rufer, Clemens; Albrecht, Rudolf; Dessler, Hans-Joachim; and Schroder, Eberhard, 3,814,810.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Goldammer, Georg; Grimm, Eberhard; and Egli, Emil, 3,813,866.

Schuchmann, Russell P.; Schutten, Herman P.; and Small, Isadore, III, to Cutler-Hammer, Inc. Universal on-delay timer. 3,814,948, Cl. 307-141.000.

Schuldt, Theodore J., Jr.: *See—*
Manke, Girard M.; Schuldt, Theodore J., Jr.; and Klein, James A., 3,814,912.

Schuler, Joseph J.: *See—*
Coleman, John W.; McGinnis, James J.; Fairbanks, John R.; Schuler, Joseph J.; McLaughlin, Patrick H.; Hoffmann, Andre A.; Newton, Kirk C.; and Johnson, George E., 3,814,356.

Schulman, Bernie: *See—*
Baron, Philip N.; and Schulman, Bernie, 3,814,438.

Schultz, Nina: *See—*
Gaudio, Domenico, 3,813,721.

Schultze, Harold E.: *See—*
Fannin, Wayne V.; and Schultze, Harold E., 3,814,219.

Schulz, Manfred B.: *See—*
Meyer, Paul C.; and Schulz, Manfred B., 3,815,056.

Schurger, Rainer, to SKF Industrial Trading and Development Company N.V. Hydrostatic thrust bearing supports. 3,814,486, Cl. 308-160.000.

Schurian, Arnold: *See—*
Streng, Erwin; and Schurian, Arnold, 3,814,564.

Schutten, Herman P.: *See—*
Schuchmann, Russell P.; Schutten, Herman P.; and Small, Isadore, III, 3,814,948.

Schwartz, William F.; and Butler, Robert W., to GTE Information Systems Incorporated. Data converting apparatus. 3,815,122, Cl. 340-347.0dd.

Schwendeman, James L.; and Salyer, Ivan O., to United States of America, Army, mesne. Composition and method for generating stabilized lacrimating foam for tunnel denial. 3,814,808, Cl. 424-360.000.

Schwenker, Eric H.: *See—*
Gemender, John F.; and Schwenker, Eric H., 3,813,893.

Sciaky, Albert M., to Welding Research, Inc. Hole center locator. 3,814,896, Cl. 219-121.0em.

Science Spectrum, Inc.: *See—*
Phillips, David T.; Brooks, Herman H.; Wyatt, Philip J.; and Liu, Chelcie B., 3,815,000.

Scientific Technology Limited: *See—*
Anati, Reuven; and Adoram, Avner, 3,814,932.

SCM Corporation: *See—*
Cappotto, Samuel D., 3,814,231.

Scotese, Anthony C.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., 3,814,761.

Scott & Williams, Inc.: *See—*
Cook, Willard P.; and Baker, J. Howard, 3,813,900.

Scott, Peter H., to Grace, W. R., & Co. Low smoke crystal flux. 3,814,637, Cl. 148-23.000.

Scrap Metals, Inc.: *See—*
Davis, Charles M., Jr.; and Fox, Joseph N., 3,814,009.

Seal assembly: *See—*
Bitzan, James A., 3,814,445.

Sealed Power Corporation: *See—*
Maskell, John S.; and Dykehouse, Roger D., 3,813,755.

Searle Medidata, Inc.: *See—*
Winchester, John E.; and Rawson, Edward B., 3,815,100.

Sears, Roebuck and Co.: *See—*
Greenblatt, Irwin; and Marino, Nicholas A., 3,814,107.

Seavey, Burton W. Detachable, convertible cuff link. 3,813,732, Cl. 24-41.000.

Seger, Michael: *See—*
Kraemer, Stefan; Seger, Michael; and Seidl, Alois, 3,814,614.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Feedforward, error-correcting systems. 3,815,040, Cl. 330-149.000.

Seidl, Alois: *See—*
Kraemer, Stefan; Seger, Michael; and Seidl, Alois, 3,814,614.

Seiffert, Stanley V.: *See—*
Howard, Jack D.; Seiffert, Stanley V.; and Wartes, Christopher R., 3,814,105.

Seiler, Virgil R. Ski cycle. 3,814,198, Cl. 180-6.00a.

Seismic Logs, Inc.: *See—*
Morris, Harold B., 3,813,744.

Seiz, Edward A. Load supports for storage structures. 3,814,034, Cl. 108-111.000.

Seki, Masahiko, to Nippon Steel Corporation. Impeller replacing device for molten metal stirring equipment. 3,814,400, Cl. 266-1.00r.

Sekisui Jushi Kabushiki Kaisha: *See—*
Yamaoka, Takao; Sasaki, Osamu; and Yamana, Takashi, 3,814,649.

Selinder, Eric P., to Hi-Shear Corporation. Separation nut. 3,813,984, Cl. 85-33.000.

Seltzer, Raymond; Gordon, David A.; and Sherman, Paul D., to Ciba-Geigy Corporation. S-triazine-imide copolymers. 3,814,719, Cl. 260-32.60n.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Derivatives of 1,2-dihydro-2-oxo-4-aminopyrimido(4,5-b)-5,10 micron-dioxides. 3,814,756, Cl. 260-247.20a.

Sensor Technology, Inc.: *See—*
Weber, Otto K., 3,814,933.

Serturini, Giuseppe, to Somet Societe Meccanica Tessile S.p.A. Cutting device for looms. 3,814,140, Cl. 139-302.000.

Seth, Ram Gopal. Fixed-fluidized bed dry cooling tower. 3,814,176, Cl. 165-104.000.

Shafer, James F., to Continental Electronics Manufacturing Company. Insulator assembly having load distribution support. 3,814,838, Cl. 174-150.000.

Shasha, Fahim Jacob. Viewer. 3,813,798, Cl. 40-70.000.

Shaw, Joseph Denman. Programmed article dispensing apparatus. 3,814,281, Cl. 221-5.000.

Sheldon Aircraft Products Corporation: *See—*
Kumpfbeck, Richard J.; and Vitolo, Aristide J., 3,815,088.

Shell, Gerald Lynwood: *See—*
Di Gregorio, David; and Shell, Gerald Lynwood, 3,814,396.
Shell Oil Company: *See—*
Fan, Hsing Y., 3,814,807.
Shelledy, Frank B.: *See—*
O'Day, Richard L.; and Shelledy, Frank B., 3,814,863.
Shelton Metrology Laboratory, Inc., mesne: *See—*
Shelton, Russell S., 3,813,789.
Shelton, Russell S., to Shelton Metrology Laboratory, Inc., mesne. Measuring apparatus. 3,813,789, Cl. 33-174.001.
Shen, Tsung-Ying; and Witzel, Bruce E. 5-Phenyl-2-piperidones and 5-phenyl-2-thiopiperidones. 3,814,771, Cl. 260-293.730.
Sherlock, John W.: *See—*
Daubman, Edward A.; and Sherlock, John W., 3,814,260.
Sherman, Paul D.: *See—*
Seltzer, Raymond; Gordon, David A.; and Sherman, Paul D., 3,814,719.
Sherman, Philip, to Instrument Development Laboratories, Inc. Method of making a domain wall propagating device. 3,813,769, Cl. 29-604.000.
Sherman Supersonic Industries Western, Inc.: *See—*
Andersen, Dan A., 3,814,053.
Sherrill, William M.: *See—*
Martin, Paul E.; Sherrill, William M.; and Green, Terence C., 3,815,135.
Shiba, Keisuke; and Sato, Akira, to Fuji Photo Film Co., Ltd. Silver halide supersensitized photographic emulsion. 3,814,609, Cl. 96-124.000.
Shibata, Akira, to Chugai Electric Industrial Co., Ltd. Process for preparing composite silber cadmium oxide alloy contact with silver cadmium surface. 3,814,640, Cl. 148-6.300.
Shibaura Electronics Co., Ltd.: *See—*
Nagata, Yasushi, 3,815,074.
Shiina, Naonori: *See—*
Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, 3,814,778.
Shiley Laboratories, Inc.: *See—*
Fettel, Bruce E.; and Burd, Samuel, 3,814,103.
Shimizu, Katsumi; and Kimura, Mamoru, to Mitsui Mining & Smelting Co., Ltd. Rotary melting furnace. 3,814,406, Cl. 266-36.00h.
Shimizu, Toyokazu: *See—*
Kuroda, Toyoaki; and Shimizu, Toyokazu, 3,814,931.
Shinetsu Chemical Company: *See—*
Yokokawa, Kiyoshi; and Tanaka, Yasuhisa, 3,814,723.
Shinozaki, Fumiaki; Ikeda, Tomoaki; Makaida, Yoshito; and Tsuboi, Masayoshi, to Fuji Photo Film Co., Ltd. and Process for producing a photolithographic printing plate. . 3,814,602, Cl. 96-29.001.
Shinsei Industries Co., Ltd.: *See—*
Wada, Tokio, 3,814,651.
Shiragai, Yasuo; and Maeno, Takeshi, to Hitachi, Ltd. Method and apparatus for optically and uniformly scanning a flat surface. 3,814,494, Cl. 350-6.000.
Shockley, Gilbert R.; and Hafer, Richard F., to Reynolds Metals Company. Racquet construction and method of making same. 3,814,423, Cl. 273-73.00c.
Sholl, Samuel A., to Clearfield Machine Company. Abrasion resistant cast ferrous alloys. 3,814,597, Cl. 75-123.0cb.
Shore, David Teignmouth, to A. P. V. Company Limited, The. Heat exchangers. 3,814,172, Cl. 165-12.000.
Showa Denko Kabushiki Kaisha: *See—*
Araki, Masatada, 3,813,758.
Showa Yakuhinkako Kabushiki Kaisha: *See—*
Kasahara, Fumio; and Takeshita, Kazuo M4 Kimitsu Chemical Laboratory Co., Ltd., 3,814,797.
Sick, Erwin, Optic-Elektronik: *See—*
Walter, Arthur, 3,814,495.
Siegener Aktiengesellschaft Geisweid: *See—*
Vollhardt, Frohmut, 3,814,062.
Siemens Aktiengesellschaft: *See—*
Huelters, Hubert, 3,814,920.
Kniepkamp, Hermann, 3,813,762.
Muenchhausen, Meinolf, 3,815,090.
Olsen, Willi, 3,814,831.
Pollmeier, Franz-Josef; and Muller, Paul, 3,815,073.
Stut, Hans, 3,814,827.
Signoret, Lucien Gaston: *See—*
Cahour, Maurice Alphonse Jules; Le Trung, Truc; and Signoret, Lucien Gaston, 3,814,565.
Sills, John T.: *See—*
Klee, David J.; and Sills, John T., 3,813,895.
Simionescu, Radu; Manof, Alexandru-Ioan-Bogdan I.; and Nita, Constantin T., to Industria Tehnico Medicala. Respiratory reanimation and anaesthesia apparatus. 3,814,092, Cl. 128-188.000.
Simms, Robert A., to Corning Glass Works. Image storage device. 3,814,977, Cl. 315-11.000.
Simon, Etienne: *See—*
Bourdon, Louis; Simon, Etienne; Borrel, Philippe; and Lehureau, Jean, 3,814,702.
Simon, Max M. Golf practice device. 3,814,439, Cl. 273-181.00r.
Simon, Stefan, to Dr. Carl Hahn GmbH. Method of and apparatus for looping tape around tampons. 3,814,469, Cl. 289-1.500.
Simoneau, Edward T.; Moeller, Ricahrd E.; and Holdstock, Norman G., to General Electric Company. Silicone resins used as surfactants in vinyl chloride. 3,814,706, Cl. 260-2.50p.
Simpson, Eric, Jr.; and Fried, Morton, to Martin Marietta Aluminum Inc. Deck assembly. 3,813,839, Cl. 52-588.000.
Simpson, Verne G.: *See—*
Glaister, Frank J.; Simpson, Verne G.; and De Zuba, George P., 3,814,722.
Sims, Roger D.: *See—*
McNally, George S.; and Sims, Roger D., 3,814,029.
Sinclair Radio Laboratories Inc.: *See—*
Kaegebein, Daniel P., 3,815,137.
Singer Company, The: *See—*
Waibel, Helmut K., 3,813,982.
Sinn, Hartmut: *See—*
Wutz, Max; and Sinn, Hartmut, 3,814,306.
S'ra Institute: *See—*
Allnutt, Anthony John; Biddles, Barry John; and Brook, Richard Anthony, 3,814,945.
Baker, Lionel Richard; Biddles, Barry John; and Williams, Thomas Llewellyn, 3,814,520.
Baker, Lionel Richard; Archer, Peter Robert; and West, Patricia Ann, 3,814,943.
Siragusa, George A.: *See—*
Marshall, Albert H.; and Siragusa, George A., 3,813,795.
Sivov, Ferdo Atanasov: *See—*
Nikolov, Ivan Dimov; Rasheev, Gueorgui Nikolov; Sivov, Ferdo Atanasov; Nikolov, Nikolai Yonkov; and Hristov, Chavdar Asenov, 3,814,127.
Sjoqvist, Lennart S. G., to Aktiebolaget Svenska Flaktfabriken. Air inlet throat for fans. 3,814,538, Cl. 415-182.000.
SKF Industrial Trading and Development Company N.V.: *See—*
Schurger, Rainer, 3,814,486.
Ski and ski practice machine: *See—*
Catlin, William Paul; and Mogul Leisure Products Limited, 3,814,417.
Skilbeck, John Paul: *See—*
Rackus, John Joseph; Skilbeck, John Paul; and Szkudlapski, Alfons Henryk, 3,814,117.
Skinner, Barry: *See—*
Beet, Roy; and Skinner, Barry, 3,813,738.
Sklar, David F.; deceased (by Stein, Frances S.; executrix). Oppositely reciprocating container inspecting machine. 3,814,241, Cl. 209-80.000.
Skogland, Thorbjorn, to General Electric Company. Method of producing electrical resistance heaters, and the improved heater products. 3,813,771, Cl. 29-615.000.
Skurray, Stephen J., to Evers and Wall Limited. De-icing spraying apparatus. 3,814,320, Cl. 239-127.000.
Skydyne, Inc.: *See—*
Weill, Robert L.; and Parsons, George B., 3,814,655.
Slabon, Siegfried; Kasten, Ludwig; and Ritz, Wilhelm, to Wilkhahn Wilkening Hahne. Seats. 3,814,475, Cl. 297-361.000.
Slaby, Robert K.; and Bredeson, Dean K., to French Oil Mill Machinery Company, The. Apparatus for treating elastomeric materials. 3,814,563, Cl. 425-203.000.
Sleeter, Michael Roy, to Marathon Electric Manufacturing Corporation. Fuse clip. 3,815,071, Cl. 337-215.000.
Sloyan, Jerome J. Motor base with shock-absorbing slidable carriage. 3,814,358, Cl. 248-23.000.
Smadar, Yechiel; Roth, Howard; McCarthy, John P.; and Moyer, John, to DCA Food Industries, Inc. Apparatus for extruding foroids of settable slurries with means to wash the extrudate during formation and severance. 3,814,560, Cl. 425-104.000.
Small, Isadore, III: *See—*
Schuchmann, Russell P.; Schutten, Herman P.; and Small, Isadore, III, 3,814,948.
SMC Corporation: *See—*
Bledsoe, James O., Jr.; Defrer, John M.; and Johnson, Walter E., Jr., 3,814,733.
Smernoff, Ronald B., to Analytical Products, Inc. Triglyceride cholesterol analysis. 3,814,255, Cl. 210-31.00c.
Smida, George R. Hydraulic chuck. 3,813,751, Cl. 29-202.00d.
Smith, Arthur J. Impact tool. 3,813,993, Cl. 91-220.000.
Smith, Carl A.: *See—*
Burket, Richard A.; Fleer, Thomas P.; Smith, Carl A.; and Love, John J., 3,814,634.
Smith, Donald O., to Micro-Bit Corporation. Electron beam type computer output in microfilm printer. 3,815,094, Cl. 340-172.500.
Smith, Edward M.: *See—*
Rand, Douglas R.; linney, Richard D.; Woods, Charles R.; and Smith, Edward M., 3,813,980.
Smith, Edward W.: *See—*
United STates of America, National Aeronautics and Space Administration, 3,813,875.
Smith, Gordon, & Co., Inc.: *See—*
Ostwald, Richard, 3,814,546.
Smith, Herbert Q.: *See—*
Whitaker, Reginald L.; and Smith, Herbert Q., 3,814,774.
Smith, Herchel: *See—*
Herbst, David R.; and Smith, Herchel, 3,814,773.
Smith, Joe H., to United States Steel Corporation. Trolley apparatus for preventing or arresting the fall of an individual. 3,814,022, Cl. 104-89.000.
Smith, Lester L. Hinges for use on folding doors and the like. 3,813,730, Cl. 16-135.000.

Smith, Peter William; and Wood, Obert Reeves, III, to Bell Telephone Laboratories, Incorporated. Transversely-excited waveguide gas laser. 3,815,047, Cl. 331-94.50r.

Smith, Sidney H.: *See—*
Brock, George W.; McCormick, Wayne; and Smith, Sidney H., 3,813,766.

Smith, Willfred F.: *See—*
Allen, Charles H.; and Smith, Willfred F., 3,814,130.

Smith, William Paul, to Graphic Arts Packaging Corp. Box blank. 3,814,303, Cl. 229-38.000.

Smithkline Corporation: *See—*
Whitecar, Alten E., 3,813,956.

Smolka, Frank R.: *See—*
Gillig, Frederick S.; Smolka, Frank R.; and Trembly, Lynn D., 3,813,784.

Smrcek, Bruno, to Schiess Aktiengesellschaft. Duplicating grinding machine. 3,813,824, Cl. 51-101.00r.

Snam Progetti S.p.A.: *See—*
Baldieri, Francesco; and Borgianni, Carlo, 3,814,699.

Snow, Edward H., to Reticon Corporation. High density photodetection array. 3,814,846, Cl. 178-7.100.

Snyder, George F.; and Stewart, Robert M., to United States Steel Corporation. Adhesives coatings and laminates utilizing ethylene copolymers and coal-tar pitch. 3,814,712, Cl. 260-28.5as.

Sobel, Jay E.: *See—*
Hayes, John C.; and Sobel, Jay E., 3,814,782.

Societa Farmaceutici Italia: *See—*
Bernardi, Luigi; Patelli, Bianca; and Temperilli, Aldemio, 3,814,765.

Societe Anonyme: *See—*
Coeurderoy, Yves G., 3,814,471.

Societe Anonyme Automibiles Citroen: *See—*
Grosseau, Albert, 3,814,928.

Societe Anonyme D.B.A.: *See—*
Toulier, Pierre, 3,814,223.

Societe Anonyme dite: Innovations pour l'Elegance Masculin: *See—*
Belpaume, Charles H., 3,813,697.

Societe Anonyme Dite: mesne: *See—*
Darbon, Pierre Andre; Claude, Rene Louis; and Chesnot, Nelly, 3,814,287.

Societe Anonyme Silec-Semi-Conducteurs: *See—*
Dumas, Guy, 3,814,639.

Societe de Fabrication d'Instruments de Mesure SFIM: *See—*
Leclercq, Ignace, 3,815,085.

Societe d'Optique Presision Electronique et Mecanique-SOPELEM: *See—*
Lardeau, Jacques, 3,814,853.

Societe Generale De Constructions Electriques et: *See—*
Lehuen, Christian; and Gillet, Roger, 3,814,959.

Society Generale de Constructions Electriques et Mechaniques (Alsthom): *See—*
Warszawski, Bernard; Verger, Bernard; and Demange, Philippe, 3,814,631.

Sofianek, Joseph C., to General Electric Company. Method of detecting a leak in a vacuum interrupter located inside a housing containing pressurized gas. 3,814,885, Cl. 200-144.00b.

Somet Societe Meccanica Tessile S.p.A.: *See—*
Serturini, Giuseppe, 3,814,140.

Sommer, Donald W., to Sperry Rand Corporation. Flow meter with bypass. 3,813,940, Cl. 73-198.000.

Sommeria, Marcel R., to Hyper-Loop, Inc. Rotary motor. 3,815,004, Cl. 318-440.000.

Song, Won R., to Esso Research and Engineering Company. Polymeric pour point depressants of vinyl aromatic and alkyl fumarate. 3,814,690, Cl. 252-56.00d.

Sony Corporation: *See—*
Nakagawa, Yutaka; and Suzuki, Masao, 3,814,851.

Sookne, Arnold M., to Burlington Industries, Inc. Fire-resistant cushioned structures. 3,813,715, Cl. 5-345.00r.

Sopcak, Edward J., to Jetro-Matic International Corporation. Method of encapsulating coils. 3,813,770, Cl. 29-605.000.

Southland, John Robert, to Omark-Winslow Aerospace Tool Co. End mill grinder. 3,813,823, Cl. 51-94.0cs.

Spannagel, Ulrich, to Amdahl Corporation. Dual output adder and method of addition for concurrently forming the differences A-B and B-A. 3,814,925, Cl. 235-175.000.

Spath, Frank-Volker: *See—*
Backstein, Gunter; and Spath, Frank-Volker, 3,814,017.

Spaulding, David B.: *See—*
Lawrence, Willis Thompson; and Spaulding, David B., 3,814,905.

Spaulding, Milton K. Gutter-type swimming pool construction. 3,813,705, Cl. 4-172.180.

Spears, Esten W., Jr.: *See—*
Beam, Paul E., Jr.; Hunt, Albert L., Jr.; and Spears, Esten W., Jr., 3,814,313.

Spencer, Louis L. Firearm chamber lubricating and cleaning device. 3,814,525, Cl. 401-190.000.

Spencer, Owen C., to Metropolitan Chicago Baptist Association. Wire mesh working apparatus. 3,814,144, Cl. 140-107.000.

Spengler, Ernst Maximilian, to Stanzlechnik GmbH Roeder & Spengler. Punching apparatus. 3,813,978, Cl. 83-401.000.

Spengler, Gunter: *See—*
Erlmeier, Robert; Hilberath, Freidrich; Meisenburg, Ewald; and Spengler, Gunter, 3,814,679.

Spercel, Robert Jack. Rod stock feed means. 3,814,299, Cl. 226-162.000.

Sperry Rand Corporation: *See—*
Aspinwall, Ronald A.; and Graham, MacKellar K., 3,814,251.
Boss, Garold D.; Crane, Vaemond H.; McBeath, Donald G.; and Thompson, Martin D., 3,815,101.
Dautel, John D.; O'Leary, Denis F.; and Turner, Hubbard C., Jr., 3,815,131.
Kanda, Alvin F., 3,815,120.
Mezger, Robert H., 3,814,250.
Prohofsky, LeRoy A., 3,813,768.
Sommer, Donald W., 3,813,940.
Whitfield, Edwin W., 3,814,929.

Sperti, Vincent R. Mechanical pencil. 3,814,524, Cl. 401-57.000.

Spier, William, Jr. Basketball return device. 3,814,421, Cl. 273-1.50a.

Spinks, Heyward Taylor: *See—*
Nelson, Isaac Hilton; and Spinks, Heyward Taylor, 3,814,961.

Spinner Osakeyhtio: *See—*
Ivanto, Osmo Juhani, 3,813,867.

Spitzer, James Edward: *See—*
Humphreys, Robert Lee; and Spitzer, James Edward, 3,814,534.

Spoelman, Leonard A., to Westinghouse Electric Corporation. Circuit interrupter comprising electromagnetic opening means. 3,815,059, Cl. 335-16.000.

Sponseller, Robert Lee: *See—*
McCardle, Arthur, Jr.; Sponseller, Robert Lee; and Gross, Charles Henry, 3,814,325.

Spotnails, Inc.: *See—*
Perkins, Garry R., 3,813,985.

Sprague, Gordon V., Jr.: *See—*
Dorosz, Adolph S.; Schaefer, Hans F., Jr.; and Sprague, Gordon V., Jr., 3,814,038.

Spratt, Richard J. Balanced fork lift truck. 3,814,272, Cl. 214-660.000.

Square D Company: *See—*
Turnbull, Merlin Y., 3,815,060.

Squibb, E. R., & Sons, Inc.: *See—*
Cioffi, Francis J., 3,814,129.
Czaplinski, Thomas V., 3,814,941.

St. Clair, Theodore A., to Textron Inc. Meter proving system. 3,813,916, Cl. 73-3.000.

Stahle, Kurt, to Concordia Maschinen- und Elektrizitats-GmbH. Device for monitoring control elements. 3,815,057, Cl. 335-1.000.

Staifer, Earl Franklin. Appliance storage apparatus. 3,814,366, Cl. 248-286.000.

Staley, A. E., Manufacturing Company, mesne: *See—*
Gunther, Robert C., 3,814,816.

Stambera, Adolf; and Leich, Rolf, to Hesser, Fr., Machinenfabrik A.G. Machine for packaging elongated articles. 3,813,849, Cl. 53-234.000.

Stanchev, Ivan Tenev; Popov, Anton Dimitrov; and Varbanov, Ivan Varbanov, to Dso Izot. Mechanism for double printing with a possibility for barring second printing. 3,814,010, Cl. 101-90.000.

Standard Oil Company: *See—*
Hengstebeck, Robert J., 3,814,307.

Stanley Works, The: *See—*
Stoutenberg, Carl Christian, 3,813,965.

Stannett, Vivian T.: *See—*
Williams, Joel L.; and Stannett, Vivian T., 3,814,676.

Stantial, Thomas D., to New Standard Company, Inc., The. Vertically adjustable suspension assembly. 3,814,023, Cl. 104-94.000.

Stanzlechnik GmbH Roeder & Spengler: *See—*
Spengler, Ernst Maximilian, 3,813,978.

Staples, John, to Mitchel & King Skates Limited. Hockey skate end cap. 3,814,453, Cl. 280-11.170.

Starrett, James R., to Bauer Bros. Co., The. Pulping system with impregantion digester having liquor recirculation and cleaning loop. 3,814,662, Cl. 162-19.000.

Stauffer Chemical Comapny: *See—*
Toy, Arthur D. F.; and Eilers, Kenneth I., 3,814,610.

Stauffer Chemical Company: *See—*
Decker, Donald Leon, 3,814,658.
Melachouris, Nicholas, 3,814,745.

Steckler, Steven Alan, to RCA Corporation. Controlled oscillator. 3,815,051, Cl. 331-117.00r.

Steelcase Inc.: *See—*
Baker, Richard H.; McNally, Donald E.; and Armstrong, Michael J., 3,814,474.

Steele, Astor Andrew, to Steele's (Contractors) Ltd. Panels with an optional through-vision facility. 3,814,506, Cl. 350-272.000.

Steele's (Contractors) Ltd.: *See—*
Steele, Astor Andrew, 3,814,506.

Steen, Douglas Rodney, to Bell Telephone Laboratories, Incorporated. Apparatus for launching a soil burrowing mole. 3,814,192, Cl. 173-44.000.

Steigerwald, Karl-Heinz: *See—*
Becker, Heinz; and Steigerwald, Karl-Heinz, 3,813,731.

Steigerwald, Karl-Heinz, to Steigerwald Strahltechnik G.m.b.H. Sealing means. 3,814,443, Cl. 277-5.000.

Steigerwald Strahltechnik GmbH: *See—*
Becker, Heinz; and Steigerwald, Karl-Heinz (said Steigerwald assor. to), 3,813,731.
Steigerwald, Karl-Heinz, 3,814,443.

Stein, Frances S.: *See—*
Sklar, David F., 3,814,241.

Steineke, Fredrik, to Elkem-Spigerverket A.S. Method of recovering fluorine from waste gases. 3,813,852, Cl. 55-71.000.

Steiner, Rudolph, to Numertap, Inc. Back spotfacing and counterboring tool. 3,814,535, Cl. 408-73.000.

Steinmetz, Lloyd L.: *See—*
Johnson, Bertram C.; and Steinmetz, Lloyd L., 3,815,046.

Steltz, Douglas C., to Portec, Inc. Device for fluidizing stored material. 3,814,295, Cl. 222-195.000.

Stemmler, Kurt, to Winkler & Dunnebier. Device for applying strip-shaped adhesive coatings to paper, cardboard and the like. 3,814,055, Cl. 118-410.000.

Stenstrom, Lennart Arvid, to Alfa-Laval AB. Heat treatment of heat-sensitive products. 3,814,889, Cl. 219-10.550.

Stephanoff, Nicholas N., to Fluid Energy Processing & Equipment Company. Dryer feed nozzle assembly. 3,814,316, Cl. 239-8.000.

Stephans, Larry C.: *See—*
Brown, Lloyd H.; and Stephans, Larry C., 3,814,626.

Stephenson, Richard D., to Universal Technology Inc. Coding and decoding method and apparatus. 3,815,092, Cl. 340-147.00p.

Stephenson, William I., Jr.: *See—*
Maier, Alfred E.; and Stephenson, William I., Jr., 3,815,064.

Stern, David M.: *See—*
Hurd, Edward T. E., III; and Stern, David M., 3,814,227.

Stetsuk, Paul, to I-T-E Imperial Corporation. Shunt trip device with integrally mounted auxiliary switch. 3,815,058, Cl. 335-8.000.

Stevens, Elbert M. Water-conserving pressure converter. 3,813,701, Cl. 4-26.000.

Stevens, J. R., & Co., Inc.: *See—*
Williams, Joel L.; and Stannett, Vivian T., 3,814,676.

Stevenson, Robert S. Dispenser and slide valve for use therein. 3,814,294, Cl. 222-181.000.

Stewart, Larry C.; and Taylor, Stephan C. Surveyor's target. 3,813,791, Cl. 33-263.000.

Stewart, Robert M.: *See—*
Snyder, George F.; and Stewart, Robert M., 3,814,712.

Stoddard, David L.; Balbas, Frank M.; and Brown, David A., to Memorex Corporation. Flexible disc drive. 3,815,150, Cl. 360-97.000.

Stoffel, Paul J., to Monsanto Company. Insecticidal compositions and methods employing trifluoromethyl substituted benzanilides. 3,814,806, Cl. 424-324.000.

Stokes, Charles S.: *See—*
United STates of America, National Aeronautics and Space Administration, 3,813,875.

Stoltman, Donald D., to General Motors Company. Turbine nozzle control. 3,814,537, Cl. 415-36.000.

Stoltz, James P.; Bruckner, James V.; and Yingst, Thomas O., to Polyvend, Inc. Ball wedge vending machine modules. 3,814,282, Cl. 221-85.000.

Stone Industrial Corporation: *See—*
Loyd, Patrick V.; and Mills, Samuel M., 3,814,139.

Stone, Julian, to Bell Telephone Laboratories, Incorporated. Liquid core multimode optical waveguide. 3,814,497, Cl. 350-96.0wg.

Stork Amsterdam N.V.: *See—*
Santen, Salomon, 3,814,234.

Stoutenberg, Carl Christian, to Stanley Works, The. Garden tool sharpener. 3,813,965, Cl. 76-82.000.

Strachle, Heinz: *See—*
Ahrens, Wilhelm; Lea, Hans; Rohm, Fritz; and Strachle, Heinz, 3,814,387.

Stratton, Willis T., 20% to Lee, Raymond, Organization, Inc., The. Educational game. 3,814,435, Cl. 273-135.00b.

Strauss,, Martin L.: *See—*
Strauss, Martin L.; Borsuk, Philip; and Alvarez, William, 3,814,013.

Strauss, Martin L.; Borsuk, Philip; and Alvarez, William, to Strauss,, Martin L. and said Alvarez assor. to said Borsuk, Philip. Stencil printr for measuring and marking carpet rolls. 3,814,013, Cl. 101-121.000.

Streng, Erwin; and Schurian, Arnold, to Kunststoffwerk Gerbrueder Anger GmbH & Co. Safety supported piston for extruded tubular elements. 3,814,564, Cl. 425-383.000.

Strepparola, Ezio: *See—*
Caporiccio, Gerardo; and Strepparola, Ezio, 3,814,741.

Stricker, Charles D.: *See—*
Sallo, Richard L.; and Stricker, Charles D., 3,814,675.

Stroup, Robert C., to Union Carbide Corporation. Apparatus for continuously converting mesophase pitch into a highly oriented structure. 3,814,566, Cl. 425-379.000.

Strucker, Gunter: *See—*
Fischer, Gerhard; and Strucker, Gunter, 3,814,268.

Struhl, Morris, Inc.: *See—*
Levine, Harvey, 3,814,898.

Stubbeman, Alfred W. Ultrasonic pulsed energy inspection system. 3,813,926, Cl. 73-67.700.

Studtmann, George H.; and Overzet, John K., to Borg-Warner Corporation. Control circuit for regulating a DC-to-DC converter. 3,815,008, Cl. 321-44.000.

Sturm, Ruger & Co., Inc.: *See—*
Ruger, William B., 3,813,804.

Stut, Hans, to Siemens Aktiengesellschaft. Method and apparatus for floating zone melting of a semiconductor rod. 3,814,827, Cl. 13-1.000.

Sudhoff, Wolfgang: *See—*
Hiersig, Heinz M.; Hansgen, Klaus; Ridder, Gerhard; and Sudhoff, Wolfgang, 3,813,897.

Sudo, Tachio: *See—*
Ozawa, Naosuke; Sudo, Tachio; and Watanabe, Shigeki, 3,813,921.

Sugita, Tadashi: *See—*
Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, 3,814,778.

Sulzer Brothers Ltd.: *See—*
Dolezal, Richard Joseph, 3,813,876.
Grotloh, Karlheinz, 3,814,375.

Sumida Equipment Industries, Inc.: *See—*
Uratani, Eiichi, 3,813,850.

Sumida, Joe T.: *See—*
Carraway, John B.; and Sumida, Joe T., 3,815,109.

Sumitomo Chemical Company, Limited: *See—*
Kawasumi, Shohachi; Hirooka, Masaaki; and Yabuuchi, Hiroshi, 3,814,734.
Yagi, Yoshiharu; Narisawa, Shizuo; Oshima, Takao; and Hata, Kazuhiko, 3,814,744.

Summa, Frank. Fluorescent lamp adapter assembly. 3,815,080, Cl. 339-52.00r.

Sun oil Company of Pennsylvania: *See—*
Iglesias, Edmundo J.; and Mayer, Robert, 3,814,542.

Sun Research and Development Co.: *See—*
Thomson, Robert M., 3,814,735.

Sunami, Hideo: *See—*
Itoh, Yokichi; and Sunami, Hideo, 3,814,955.

Sunderland, Luther D.: *See—*
Coppola, Patrick S.; Sunderland, Luther D.; and Wildrick, Milton L., 3,813,990.

Superior Tube Company: *See—*
Bibighaus, Fred W., 3,813,911.

Suprenant, Paul J.: *See—*
Robbins, Frederick L., Jr.; and Suprenant, Paul J., 3,813,946.

Surowiec, Edward P.: *See—*
Ghaem-Maghami, Sanjar; and Surowiec, Edward P., 3,814,842.

Suunto Oy: *See—*
Jarvenpaa, Kauko Olavi, 3,813,792.

Suzuki, Hiroshi; Iriuchijima, Makoto; Nakamura, Koichi; and Yagi, Kazuharu, to Maruzen Oil Company. Polymerizable liquid compositions for unsaturated polyester resins. 3,814,724, Cl. 260-40.00r.

Suzuki, Masao: *See—*
Nakagawa, Yutaka; and Suzuki, Masao, 3,814,851.

Suzuki, Naohiko: *See—*
Hosoda, Kirokuro; Shiina, Naonori; Kadowaki, Yoshio; Hashimoto, Makoto; Suzuki, Naohiko; and Sugita, Tadashi, 3,814,778.

Swain, Kenneth W.: *See—*
Di Marco, Bernard; Swain, Kenneth W.; and Kralik, Andrew J., 3,815,072.

Swales, Danvers Allin, to Albright & Wilson Limited. Treatment of sewage or contaminated water. 3,814,686, Cl. 210-47.000.

Swander, Kenneth D., Jr.; and Wilkins, Ronald D., to Certain-Teed Products Corporation. Internal air assisted brake actuator. 3,813,994, Cl. 91-471.000.

Swarovski, D., & Co.: *See—*
Ebenbichler, Hubert, 3,814,500.

Swartz, Richard L.: *See—*
Dillard, John W.; Tringali, Dominick; and Swartz, Richard L., 3,814,242.

Sweany, Louis P., to Mallory, P. R., & Co., Inc. Piezoelectric transducer and noise making device utilizing same. 3,815,129, Cl. 340-388.00r.

Sweeney, B. K., Manufacturing Co.: *See—*
Weiss, Lowell Warner; and Fitzgerald, Clendon Hart, 3,813,933.

Sweeney, Donald E., Jr., to Texaco Inc. Means and method for controlling alkylation unit to achieve and maintain a desired hydrocarbon content for recycle acid. 3,814,915, Cl. 235-151.120.

Sweeney, Donald E., Jr., to Texaco Inc. Means and method for controlling an alkylation unit to achieve a desired feed isobutane flow rate. 3,814,916, Cl. 235-151.120.

Swenson, Marvin E. Head gate. 3,814,060, Cl. 119-98.000.

Swin, William A.; and Reising, Flavian, Jr., to General Electric Company. Transformer-diode isolated circuits for high voltage power supplies. 3,815,015, Cl. 323-22.00t.

Sykes, Henry, Limited: *See—*
Allen, Ronald Noel; and Potter, Ernest William, 3,814,184.

Sylvie, Arthur J.: *See—*
Sylvie, F. Arthur, 3,813,720.

Sylvie, F. Arthur, to Sylvie, Arthur J. Power-driven rotary brush. 3,813,720, Cl. 15-23.000.

Systems Technology Corporation: *See—*
Wittmann, Thomas J., 3,814,568.

Szabo, Marton; and Bush, George W. Rigid substantially U-shaped handle with closed-cell foam handgrip. 3,813,729, Cl. 16-119.000.

Szeyller, Mathias E. Postcard coin carrier, and method. 3,814,305, Cl. 229-92.900.

Szilagyi, Dezso: *See—*
Kormos, Kalman; and Szilagyi, Dezso, 3,814,380.

Szkudlapski, Alfons Henryk: *See—*
Rackus, John Joseph; Skilbeck, John Paul; and Szkudlapski, Alfons Henryk, 3,814,117.

Tabor, John R. Method for constructing an underground railway. 3,813,885, Cl. 61-44.000.

Tajihi, Michio, to Kabushiki Kaisha Yamamoto Kogyosho. Fibrous roll impregnated with developer liquid and method of making same. 3,814,054, Cl. 118-258.000.

Takada, Takezo, to Takata Kojyo Co., Ltd. Pendulum operated inertia switch for safety belt mechanism with reciprocating cam follower. 3,814,875, Cl. 200-61.480.

Takahashi, Akira; and Kuwabara, Masahiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for finishing the tooth surfaces of hypoid gears. 3,813,821, Cl. 51-89.000.

Takahashi, Ikuo; and Hasegawa, Yasuhiro, to Tokyo Precision Instruments Co., Ltd. Servo valve. 3,814,131, Cl. 137-625.620.

Takahashi, Shiro; and Asao, Takeshi, to Asahi Glass Co., Ltd. Method of detecting defects in transparent and semitransparent bodies. 3,814,946, Cl. 250-572.000.

Takahashi, Susumu; Sato, Hitoshi; and Kaneko, Yoichi, to Hitachi, Ltd. Semiconductor device suitable for impatt diodes or varactor diodes. 3,814,997, Cl. 357-58.000.

Takahashi, Toru; Kadowaki, Hidejiro; and Kuge, Tsukasa, to Canon Kabushiki Kaisha. Scattered toner shield device in electrophotographic copying machine. 3,814,515, Cl. 355-3.0dd.

Takahashi, Yoshinori; and Takizawa, Masao, to Hitachi, Ltd. Elevator control apparatus. 3,814,215, Cl. 187-29.00r.

Takata Kojyo Co., Ltd.: *See*—
Takada, Takezo, 3,814,875.

Takata, Masanobu; Osakabe, Kuniharu; and Murata, Yoshio, to Hitachi, Ltd. Luminescent screen for flying-spot cathode-ray tube. 3,814,967, Cl. 313-468.000.

Takeda, Hiromu, to Toray Industries, Inc. Method of manufacturing fibers and films from an acrylonitrile copolymer. 3,814,739, Cl. 260-85.50r.

Takeshita, Kazuo M4 Kimitsu Chemical Laboratory Co., Ltd.: *See*—
Kasahara, Fumio; and Takeshita, Kazuo M4 Kimitsu Chemical Laboratory Co., Ltd., 3,814,797.

Takizawa, Masao: *See*—
Takahashi, Yoshinori; and Takizawa, Masao, 3,814,215.

Talkin, Albert I.; Toda, Kenji; and Roffman, Gary L., to United States of America, Army. Matched acoustic generator. 3,813,920, Cl. 73-37.000.

Tamkin, Michael S., to Zenith Radio Corporation. Combination high voltage multiplier and focus voltage divider for a television receiver with housing means. 3,814,989, Cl. 317-120.000.

Tamura, Fumio: *See*—
Araki, Tadashi; Asano, Kiro; Kosugi, Junichi; and Tamura, Fumio, 3,814,642.

Tamura, Gakuzo: *See*—
Arima, Kei; Kawamura, Takeshi; Tamura, Gakuzo; and Beppu, Teruhiko, 3,814,795.

Tanaka, Eihachiro; Onodera, Yutaka; Fukuda, Takeji; Yamashita, Tsutomu; and Kuma, Shoji, to Research Institute for Iron, Steel and other Metals of the Tohoku University, The. Method of producing laminated pancake type superconductive magnets. 3,813,764, Cl 29-599.000.

Tanaka, Shoji: *See*—
Honda, Toshio; Kobota, Eishi; Tanaka, Shoji; and Fukuura, Yokio, 3,814,713.

Tanaka, Yasuhisa: *See*—
Yokokawa, Kiyoshi; and Tanaka, Yasuhisa, 3,814,723.

Tanasawa, Yasushi: *See*—
Inoue, Tokuta; Yamada, Mitsumasa; Nakanishi, Kiyoshi; Tanasawa, Yasushi; and Yamaguchi, Shunzo, 3,813,879.

Tanguy, Denis R.; and Kishel, Joseph F. Methods and apparatus for detecting the entry of formation gas into a well bore. 3,813,935, Cl. 73-153.000.

Taniguchi, Motoji; Kitamura, Shigeo; Ishizawa, Kazutomo; and Miyazaki, Murao, to Kanegafuchi Boseki Kabushiki Kaisha. Testing apparatus for measuring thermal behaviors of filament yarn. 3,813,919, Cl. 73-15.600.

Tanimoto, Takaaki: *See*—
Hirowatari, Tomoyuki; Kurihara, Tomomichi; Kokumai, Akihisa; Hori, Toru; and Tanimoto, Takaaki, 3,814,042.

Tarancon, Gregorio: *See*—
Prince, Martin; Blanck, Hillard; and Tarancon, Gregorio, 3,814,615.

Tate, Donald P., to Control Data Corporation. Pipeline binary multiplier. 3,814,924, Cl. 235-164.000.

Tate, John F. P. Precast garden steps. 3,813,831, Cl. 52-189.000.

Taube, David Carl: *See*—
Wardill, Gordon Agar; Taube, David Carl; and Cornell, Alan Ananias, 3,814,464.

Tavernetti, Richard R.; and Tennant, Samuel M. Prosthetic knee device. 3,813,700, Cl. 3-1.000.

Taylor, David Ernest Meguyer, to National Research Development Corporation. Patient monitoring systems. 3,814,082, Cl. 128-2.05r.

Taylor, Stephan C.: *See*—
Stewart, Larry C.; and Taylor, Stephan C., 3,813,791.

Tazawa, Eiichi: *See*—
Kobayashi, Sadao; Tazawa, Eiichi; Matsunaga, Mitsuro; Hoshino, Chikafusa; and Kunisaki, Hideo, 3,814,619.

Tecalemit (Engineering) Ltd.: *See*—
Grantham, Max Edward, 3,814,128.

Technicon Instruments Corporation: *See*—
Watts, Leonard, 3,814,166.

Tecna Corporation: *See*—
Kitrilakis, Sotiris; and Robinson, Thomas C., 3,814,547.

Teijin Limited: *See*—
Arakawa, Tamio; and Kuroda, Yozi, 3,814,792.
Iribe, Seiki; Yamaguchi, Norihisa; and Kobayashi, Tukasa, 3,814,141.

Telebeam Corporation: *See*—
Ulicki, Edward M., 3,814,841.

Telecommunications Technology, Inc.: *See*—
Lubarsky, Andra, Jr.; and Pospisil, Richard E., 3,814,839.
Lubarsky, Andre, Jr.; and Warner, G. Scott, 3,814,840.

Teletype Corporation: *See*—
Nash, Leonard A., 3,815,146.

Temperilli, Aldemio: *See*—
Bernardi, Luigi; Patelli, Bianca; and Temperilli, Aldemio, 3,814,765.

Tennant, Samuel M.: *See*—
Tavernetti, Richard R.; and Tennant, Samuel M., 3,813,700.

Tenneco Chemicals, Inc.: *See*—
Miller, Robert S., 3,814,740.
Minieri, Pasquale P., 3,814,714

Terry, Virgil P.: *See*—
Wilson, William L., 3,814,190.

Teszner, Stanislas. Field-effect gridistor-type transistor structure. 3,814,995, Cl. 357-22.000.

Tewksbury, Stuart Keene, to Bell Telephone Laboratories, Incorporated. Discrete adaptive delta modulation system. 3,815,033, Cl. 329-104.000.

Texaco Inc.: *See*—
Allen, Joseph C., 3,814,186.
Sweeney, Donald E., Jr., 3,814,915.
Sweeney, Donald E., Jr., 3,814,916.

Texas Instruments Incorporated: *See*—
Reinberg, Alan R.; and Fish, John G., 3,814,641.
Wester, Aaron H., 3,815,095.

Textron Inc.: *See*—
St. Clair, Theodore A., 3,813,916.

Thal, Ben. Surgical instrument. 3,814,102, Cl. 128-321.000.

Thiermann, William E. Snap-on attachment for utility service trailers and the like. 3,813,735, Cl. 24-201.0sl.

Thomas, Paul E.; and Colla, Jeannine O., to Johnson Service Company. Pressure sensitive capacitance sensing element. 3,814,998, Cl. 317-246.000.

Thomas, Richard N.: *See*—
Nathanson, Harvey C.; Thomas, Richard N.; and Guldberg, Jens, 3,814,968.

Thomas, Robert, to Big Three Industries, Inc. Pipe beveling apparatus. 3,813,968, Cl. 82-4.00c.

Thomasen, Norman Leonard. Two-way loudspeaker system with tow tandem-connected high-range speakers. 3,814,857, Cl. 179-1.00d.

Thompson, Harry B.: *See*—
Johnson, Stephen I.; and Thompson, Harry B., 3,814,444.

Thompson, Martin D.: *See*—
Boss, Garold D.; Crane, Vacmond H.; McBeath, Donald G.; and Thompson, Martin D., 3,815,101.

Thompson, Milo L. Pet bed. 3,814,058, Cl. 119-19.000.

Thompson, William W., to Niven, Mary G. Grass trimmer. 3,814,189, Cl. 172-13.000.

Thomson, Robert M., to Sun Research and Development Co. Polyimide polymer of alkyladamantane diamine and polyanhydride. 3,814,735, Cl. 260-65.000.

Thomson-CSF: *See*—
Longuet, Maurice, 3,814,847.
Reboul, Jean Philippe, 3,814,970.

Thornton, William Hermann Brenner. Automatic tea or coffee maker. 3,814,004, Cl. 99-283.000.

Thorogood, Robert M.: *See*—
Geist, Jacob M.; Paul, Roy A.; and Thorogood, Robert M., 3,814,397.

Thouret, Wolfgang E.; and Kaufman, Rudolph, to Duro-Test Corporation. Electric lamps of the vibrating filament type having a conductive coating. 3,814,973, Cl. 313-313.000.

Thurman, Woodrow W.: *See*—
Hardin, Bobby O.; and Thurman, Woodrow W., 3,813,929.

Tilbury, Lawrence E., to Case, J. I., Company. Powered lift and lock for a foldable implement frame. 3,814,191, Cl. 172-311.000.

Timashov, Viktor Alexandrovich: *See*—
Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Germanchuk, Vyacheslav Nikolaevich, 3,814,829.

Timmler, Helmut: *See*—
Draber, Wilfried; Timmler, Helmut; Buchel, Karl Heinz; and 3,814,802.

Timpe, Atwood M. Filter Apparatus. 3,814,252, Cl. 210-94.000.

TLC Corporation: *See*—
Tocci, Paul M., 3,814,584.

Tocci, Paul M., to TLC Corporation. Analytical method employing active material contained in a flow-through bag. 3,814,584, Cl. 23-230.00b.

Toda, Kenji: *See*—
Talkin, Albert I.; Toda, Kenji; and Roffman, Gary L., 3,813,920.

Toda, Sadasuke: *See*—
Hirano, Tadao; Toda, Sadasuke; and Okugawa, Katuo, 3,815,087.

Todd, Theodore J. Pressure compensating trickle valve. 3,814,377, Cl. 251-145.000.

Todd-Shipyards Corporation: *See*—

Fink, William Lloyd, 3,815,116.
Tokura, Susumu: *See—*
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,814,561.
Tokyo Precision Instruments Co., Ltd.: *See—*
Takahashi, Ikuo; and Hasegawa, Yasuhiro, 3,814,131.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Kokado, Naoyuki, 3,814,855.
Sakurai, Masami; and Tsuruta, Saburou, 3,814,982.
Tomarelli, Rudolph M.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., 3,814,761.
Tomita, Masao: *See—*
Fujisawa, Kiyoji; and Tomita, Masao, 3,815,039.
Tomlinson, Walter John, III; and Weber, Heinz Paul, to Bell Telephone Laboratories, Incorporated. Integrated optical circuit devices employing optical gratings. 3,814,498, Cl. 350-96.0wg.
Toray Industries, Inc.: *See—*
Takeda, Hiromu, 3,814,739.
Tornquist, Erik; and Langer, Arthur W., Jr., to Esso Research and Engineering Company. Process for polymerizing alpha-olefins. 3,814,743, Cl. 260-93.700.
Tosti, Anthony. Method and apparatus for sealing root canals and anchoring teeth. 3,813,779, Cl. 32-13.000.
Toth, Alex, to Ellis Corporation. Laundry machine. 3,813,903, Cl. 68-210.000.
Toulier, Pierre, to Societe Anonyme D.B.A. One-way clutch device for the starter drive of an internal combustion engine. 3,814,223, Cl. 192-46.000.
Toy, Arthur D. F.; and Eilers, Kenneth I., to Stauffer Chemical Comapny. Polymeric compositions containing bis(2.3-dihalopropyl) 2-cyano-alkylphosphonates as flame retardants. 3,814,610, Cl. 106-16.000.
Toyo Kogyo Company Limited: *See—*
Hayashi, Kunihisa; and Fujimoto, Norihiro, 3,813,818.
Toyo Rubber Industry Co., Ltd., The: *See—*
Hashida, Taizo; Okumura, Masaru; and Fujishima, Hiroyasu, 3,814,162.
Oka, Shoji; and Wakabayashi, Takashi, 3,814,781.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Inoue, Tokuta; Yamada, Mitsumasa; Nakanishi, Kiyoshi; Tanasawa, Yasushi; and Yamaguchi, Shunzo, 3,813,879.
Takahashi, Akira; and Kuwabara, Masahiro, 3,813,821.
Trembly, Lynn D.: *See—*
Gillig, Frederick S.; Smolka, Frank R.; and Trembly, Lynn D., 3,813,784.
Tremmel, Robert A.: *See—*
Adamowicz, Norman C.; Klein, Roy W.; and Tremmel, Robert A., 3,814,674.
Tringali, Dominick: *See—*
Dillard, John W.; Tringali, Dominick; and Swartz, Richard L., 3,814,242.
Triumph Werke Nuernberg, A.G.: *See—*
Blum, Rudolf, 3,814,228.
Triumph Werke Nurnberg A.G.: *See—*
Kohlhage, Hermann, 3,814,229.
Troiano, Daniel A. Floatable safety cover for swimming pools. 3,813,704, Cl. 4-172.130.
Trojan Luggage Company, The: *See—*
Brody, Leo L., 3,814,220.
Trombley, Bertrand N.: *See—*
Clark, Harry L.; Trombley, Bertrand N.; and Eicholtz, Clara V., 3,814,489.
Trotta, Michael. Mechanical data memory device having helicoid data cards and programming means therefor. 3,814,906, Cl. 235-61.12r.
Troutner, Arthur L., to Trus Joist Corporation. Laminated, variable density, structural wood products and method for making the same. 3,813,842, Cl. 52-693.000.
Trus Joist Corporation: *See—*
Troutner, Arthur L., 3,813,842.
TRW Inc.: *See—*
Hook, William R.; Dishington, Roland H.; and Hilberg, Ronald P., 3,815,044.
Van Buren, Harold S., Jr., 3,814,467.
Tschritter, Alfons, to Colortronic Reinhard & Co., KG. Metering apparatus for plastic materials. 3,814,296, Cl. 222-220.000.
Tsuboi, Masayoshi: *See—*
Shinozaki, Fumiaki; Ikeda, Tomoaki; Makaida, Yoshito; and Tsuboi, Masayoshi, 3,814,602.
Tsuchida, Isamu. Apparatus for detecting and correcting torsion of travelling favric. 3,813,862, Cl. 57-1.0un.
Tsurumi, Sukeo. Cuboidal structures. 3,813,841, Cl. 52-648.000.
Tsuruta, Saburou: *See—*
Sakurai, Masami; and Tsuruta, Saburou, 3,814,982.
Tunesi, Roger. Stabilizing and anti-zigzag device for caravans and trailers. 3,814,463, Cl. 280-406.00a.
Tup! (Panama) S.A.: *See—*
Tupper, Earl Silas, 3,814,112.
Tupper, Earl Silas, to Tup! (Panama) S.A. Grooming implements. 3,814,112, Cl. 132-11.00r.
Turnbull, Merlin Y., to Square D Company. Electromagnetic contactor for battery powered vehicles. 3,815,060, Cl. 335-133.000.
Turner, Earl W.: *See—*
Oliver, Robert J.; and Turner, Earl W., 3,814,821.
Turner, Eugene E.: *See—*
Turner, Webster T.; and Turner, Eugene E., 3,813,800.
Turner, Hubbard C., Jr.: *See—*
Dautel, John D.; O'Leary, Denis F.; and Turner, Hubbard C., Jr., 3,815,131.
Turner, Webster T.; and Turner, Eugene E. Extensible display frame. 3,813,800, Cl. 40-155.000.
Tutui, Fumihiro: *See—*
Matsufuji, Akira; Kishikawa, Kanichi; Sasaki, Yasuto; Miyaji, Susumu; and Tutui, Fumihiro, 3,813,912.
Twisselmann, Lorenz: *See—*
Gast, Theodor; Twisselmann, Lorenz; and Marx, Wolf-Rudiger, 3,815,018.
Ueda, Kensaku: *See—*
Kamiya, Shigeru; Ohtsuka, Hitoshi; and Ueda, Kensaku, 3,814,969.
Ulicki, Edward M., to Telebeam Corporation. Communication system with premises access monitoring. 3,814,841, Cl. 178-5.100.
Ulmer, Robert P.: *See—*
Holmen, James O.; and Ulmer, Robert P., 3,814,591.
Ungar, Israel S.: *See—*
Scher, Herbert I.; Ungar, Israel S.; and McQuade, John E., Jr., 3,814,647.
Unger, Henry M. Holder for replaceable cleaning element. 3,813,724, Cl. 15-150.000.
Union Barbide Corporation: *See—*
Kowalski, Edward W.; and Plesich, Marion F., 3,814,716.
Union Camp Corporation: *See—*
Friend, William H.; Natof, Stuart L.; Reiter, Eugene A.; and Eudman, David W., 3,813,999.
Union Carbide Corporation: *See—*
Kozak, Theordore Fredrick, 3,814,101.
Stroup, Robert C., 3,814,566.
Union Industrielle Blanzy-Quest: *See—*
Montacie, Marcel, 3,814,481.
Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft: *See—*
Erlmeier, Robert; Hilberath, Freidrich; Meisenburg, Ewald; and Spengler, Gunter, 3,814,679.
Union Tank Car Company: *See—*
Yopp, John, 3,814,381.
United Aircraft Corporation: *See—*
Bielawa, Richard L., 3,814,351.
Meyer, Richard C., 3,813,934.
United States of America
Agriculture: *See—*
Calvert, Corlette C.; Morgan, Neal O.; and Martin, Richard D., 3,814,057.
Laundrie, James F., 3,814,240.
Pittman, Allen G.; Wasley, William L.; and Jones, Carloton C., 3,814,578.
Air Force: *See—*
Ainsworth, Glenn C.; and Schneider, Marion F., 3,814,940.
Enstrom, Ronald Edward; and Fisher, Dennis Glendon, 3,814,996.
Kraft, Sidney; and Preston, Francis R., 3,815,026.
Martin, Paul E.; Sherrill, William M.; and Green, Terence C., 3,815,135.
Milam, David, 3,814,503.
Parker, Jeffrey M.; Dawson, Edward C.; and Kramer, Anthony J., 3,815,032.
Wilson, Dennis L., 3,815,029.
Air Force, mesne: *See—*
Cox, George B., Jr.; and Huls, Ralph M., 3,814,575.
Army: *See—*
Hines, Harold L., Jr., 3,814,019.
Johnson, James V., 3,813,788.
Kennedy, Andrew J., 3,814,993.
Peach, John B.; and McEachnie, William E., 3,814,837.
Rodgers, Aubrey, 3,813,949.
Talkin, Albert I.; Toda, Kenji; and Roffman, Gary L., 3,813,920.
Army, mesne: *See—*
Schwendeman, James L.; and Salyer, Ivan O., 3,814,808.
Atomic Energy Commission: *See—*
Boardman, Charles Robert, 3,814,185.
Carman, Robert L., Jr.; and Rhodes, Charles K., 3,815,043.
Davis, Thomas J., 3,815,038.
Guggenheim, S. Frederic; and Graveson, Robert T., 3,814,552.
Johnson, Bertram C.; and Steinmetz, Lloyd L., 3,815,046.
Pappas, William S., 3,814,587.
Pepper, William B., Jr.; and Buxton, Robert J., 3,814,355.
Environmental Protection: *See—*
Rachor, Donald G.; and Perry, Richard A., 3,814,685.
National Aeronautics and Space Administration: *See—*
Carraway, John B.; and Sumida, Joe T., 3,815,109.
Hamlet, John F., 3,815,048.
Parker, John A.; Dimeff, John; and Heimbuch, Alvin H., 3,814,939.
National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Gelb, Leonard L.; Helbert, William B., Jr.; Enie, Ronald B.; and Mulliken, Richard F. Method of repairing discontinuity in fiberglass structures. 3,814,645, Cl. 156-94.000.
Golden, Donald P.; Hoffler, George W.; and Wolthuis, Roger A. Apparatus and method for processing korotkov sounds. 3,814,083, Cl. 128-2.05a.

Lewis, Beverley W.; Stokes, Charles S.; Smith, Edward W.; and Murphy, William J. Rocket having barium release system to create ion clouds in the upper atmosphere. 3,813,875, Cl. 60-39.460.
Wetzler, Dallas G. Thrust-isolating mounting. 3,814,350, Cl. 244-1.0ss.
National Aeronautics and Space Administration with respect to an invention of; Administrator:
McCreight, Louis R. Electrophoretic sample insertion. 3,814,678, Cl. 204-180.00r.
National Aeronautics and Space asministration: *See—*
Heier, Wilbur C., 3,814,653.
Navy: *See—*
Marshall, Albert H.; and Siragusa, George A., 3,813,795.
United States Steel Corporation: *See—*
Hubble, David H.; and Yount, Joseph G., Jr., 3,814,613.
Mould, Peter R.; and Gray, John M., 3,814,636.
Sallo, Richard L.; and Stricker, Charles D., 3,814,675.
Smith, Joe H., 3,814,022.
Snyder, George F.; and Stewart, Robert M., 3,814,712.
Universal Business Machines, Incorporated: *See—*
Dillard, John W.; Tringali, Dominick; and Swartz, Richard L., 3,814,242.
Universal Oil Products Company: *See—*
Fenske, Ellsworth R.; and McLaughlin, James H., 3,813,925.
Hayes, John C.; and Sobel, Jay E., 3,814,782.
Latos, Edwin J., 3,814,212.
Nolley, John Paul, Jr., 3,814,262.
Radke, Arthur O., 3,814,493.
Universal Sales Engineering, Inc.: *See—*
Pendleton, Kenneth L., 3,813,923.
Universal Technology Inc.: *See—*
Brady, John Francis; and Grill, William Augustus, 3,814,504.
Stephenson, Richard D., 3,815,092.
University of Kentucky Research Foundation, The, mesne: *See—*
Hardin, Bobby O.; and Thurman, Woodrow W., 3,813,929.
Upjohn Company, The: *See—*
Argoudelis, Alexander D.; Bergy, Malcolm E.; and Pyke, Thomas R., 3,814,796.
Le Roy, Raymond F., Sr., 3,814,079.
Nadeau, Herbert G., 3,814,659.
Uratani, Eiichi, to Sumida Equipment Industries, Inc. Oil recovery method for displacement rotary air compressor. 3,813,850, Cl. 55-29.000.
Urbanosky, Harold J.; and Whitten, Frank R., to Schlumberger Technology Corporation. Methods and apparatus for testing earth formations. 3,813,936, Cl. 73-155.000.
U.S. Philips Corporation: *See—*
Foster, Alan, 3,813,761.
Hansen, Norbert Ernst Fritz; and Littmann, Walter Fritz Konrad, 3,814,629.
Neelen, Gregorius Theodorus Maria, 3,813,881.
USM Corporation: *See—*
Dorosz, Adolph S.; Schaefer, Hans F., Jr.; and Sprague, Gordon V., Jr., 3,814,038.
Hanson, Raymond; and Vinter, Sydney A., 3,814,656.
Robbins, John E., 3,814,289.
Vacano, Nickolas Lothar, to Rainier Companies, Inc., The. Brewing apparatus. 3,814,003, Cl. 99-276.000.
Van Acker, Joseph Edward. Coin dispensing apparatus. 3,814,115, Cl. 133-4.000.
Van Alsburg, Earl Roger, to American Can Company. Cutting means. 3,813,972, Cl. 82-82.000.
Van Antwerp, Robert L., to Magnavox Company, The. Phonograph record player. 3,814,442, Cl. 274-39.00a.
Van Buren, Harold S., Jr., to TRW Inc. Connector for flexible conduit. 3,814,467, Cl. 285-92.000.
van der Lely, Ary: *See—*
van der Lely, Cornelis; and van der Lely, Ary, 3,813,793.
van der Lely, Cornelis; and van der Lely, Ary. Crop processing devices. 3,813,793, Cl. 34-57.00r.
Van Gordon, Donald V.; and McNally, Peter J., to M & T Chemicals Inc. Corrosion-proof closure assembly. 3,814,276, Cl. 220-39.00r.
Van Handel, Ambrose B.; and Brent, Jerome J. Intra-oral method of making dentures. 3,813,777, Cl. 32-2.000.
Van Handel, Ambrose B. Flexible artificial denture. 3,813,778, Cl. 32-2.000.
Van Zutphen, Clement J.; and Moran, Brian J., to Cotswold Dairy Equipment U.S.A. Ltd. Automatic bulk tank cleansing system. 3,814,291, Cl. 222-148.000.
Vander Schaaf, Clair D. Advertising or novelty device. 3,813,801, Cl. 40-306.000.
Vangsness, Gordon A. Meter bar construction 285/030.000. 3,814,465, Cl. .
Vanti, Lamberto, to Fiat Societa Per Azioni. Servo-operated electrovalve. 3,814,134, Cl. 137-627.500.
Varbanov, Ivan Varbanov: *See—*
Stanchev, Ivan Tenev; Popov, Anton Dimitrov; and Varbanov, Ivan Varbanov, 3,814,010.
Varian Associates: *See—*
Sain, William H., 3,814,972.
Varney, Gordon: *See—*
Ganderton, David; McAinsh, James; and Varney, Gordon, 3,814,097.
Veh, Herbert, to Elecktroteile GmbH. Solenoid operated compressed air valve. 3,814,133, Cl. 137-625.650.
Venlet, Cornelis N.: *See—*
Rombach, Frank; and Venlet, Cornelis N., 3,814,002.
Venton, Peter Charles: *See—*
Repton, Charles Samuel; Venton, Peter Charles; and Hodges, Kenneth James Hamer, 3,814,919.
Verdone, Joseph A.; and Kebles, Michael K., to Eastman Kodak Company. Colloidal metal in non-aqueous media. 3,814,696, Cl. 252-317.000.
Vereinigte Osterreichische Eisen- und Stahlwerke-Aktiengesellschaft: *See—*
Listhuber, Friedrich; Fastner, Thorwald; and Bachner, Ernst, 3,814,167.
Verger, Bernard: *See—*
Warszawski, Bernard; Verger, Bernard; and Demange, Philippe, 3,814,631.
Vestra-Union S.A.: *See—*
Heiler, Wolfgang; Muller, Rudolf; and Becker, Jean-Jacques, 3,814,039.
Vice, Robert M. Guide track for a stairway elevator. 3,814,027, Cl. 104-247.000.
Victoreen, John A. Condenser microphone having a plurality of discrete vibratory surfaces. 3,814,864, Cl. 179-111.00r.
Vien, Andre: *See—*
Morane, Bruno P.; and Vien, Andre, 3,814,113.
Viglione, Giovanni, to Nuovan San Giorgio S.p.A. Method for automatically doffing cops in a ring spinner. 3,813,870, Cl. 57-156.000.
Villa, Egidio: *See—*
Morresi, Nello; and Villa, Egidio, 3,814,208.
Villa, Giovanni: *See—*
Palazzetti, Mario; Cavallarin, Bruno; and Villa, Giovanni, 3,815,069.
Vinal, Albert W., to International Business Machines Corporation. Magnetic key mechanism or the like. 3,815,066, Cl. 335-306.000.
Vinter, Sydney A.: *See—*
Hanson, Raymond; and Vinter, Sydney A., 3,814,656.
Vitolo, Aristide J.: *See—*
Kumpfbeck, Richard J.; and Vitolo, Aristide J., 3,815,088.
Voice, Ernest Wallace; and Hawkes, David Alec, to British Iron and Steel Research Association, The. Process for making iron or steel. 3,814,596, Cl. 75-40.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Gospodar, Reinhard, 3,814,065.
Heitland, Herbert, 3,814,589.
Vollhardt, Frohmut, to Siegener Aktiengesellschaft Geisweid. Waste heat boiler with boiler walls and wall portions of finned pipes. 3,814,062, Cl. 122-6.00a.
Vollrath Co., The: *See—*
Lebahn, Arthur C., 3,813,896.
Volz, Hermann, to Allweiler AG and Fluid displacement apparatus having helical displacement elements. . 3,814,557, Cl. 418-197.000.
von der Eltz, Hans-Ulrich: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; Meininger, Fritz; Mischke, Peter; and Schon, Franz, 3,814,579.
Vornberger, George F., to Pullman Incorporated. Extruded dump trailer body. 3,814,479, Cl. 298-23.00m.
Vos, Arend W. D.: *See—*
Maker, David L.; Peng, Stephen C.; and Vos, Arend W. D., 3,814,720.
Vrba, James J.; and Buedel, Charles K., to GTE Automatic Electric Laboratories, Incorporated. Communication switching system transceiver arrangement for serial transmission. 3,814,859, Cl. 170-15.0al.
Wacker-Chemie GmbH: *See—*
Nitzsche, Siegfried; Marwitz, Heinrich; and Hockemeyer, Friedrich, 3,814,731.
Wada, Tokio, to Shinsei Industries Co., Ltd. Labeler. 3,814,651, Cl. 156-541.000.
Wagenknecht, Katharina, nee Hissbach. Constructional element. 3,813,840, Cl. 52-619.000.
Wagner Electric Corporation: *See—*
Cake, Arthur F., 3,814,954.
Wagner, Ronald M., to General Motors Corporation. Four terminal power transistor. 3,814,994, Cl. 357-43.000.
Wagner, Walter. Method of applying tape. 3,814,643, Cl. 156-71.000.
Waibel, Helmut K., to Singer Company, The. Knife cutter. 3,813,982, Cl. 83-602.000.
Wakabayashi, Takashi: *See—*
Oka, Shoji; and Wakabayashi, Takashi, 3,814,781.
Wakabayashi, Yasuo. Illuminated figure indicating, counter. 3,814,908, Cl. 235-92.0ea.
Waldrum, John E., to Amchem Products, Inc. Mist coating of strip material. 3,814,322, Cl. 239-251.000.
Waldspurger, Edward C., to Nichols, William E. and Arvin Industries, Inc. Precision drive for video disc recorder using a free running or crystal controlled oscillator. 3,814,844, Cl. 178-6.60p.
Wallace, Charles H., to International Telephone and Telegraph Corporation. Processing hogs. 3,814,814, Cl. 426-2.000.
Wallace, Virgil T. Steering linkage testing apparatus. 3,813,932, Cl. 73-118.000.
Wallskog, Alan G., to Edelmann, E., & Co. Locking gas cap. 3,813,904, Cl. 70-169.000.

Walter, Arthur, to Sick, Erwin, Optic-Elektronik. Apparatus for producing a moving beam displaced parallel to itself. 3,814,495, Cl. 350-7.000.

Wang, Su-Sun, to Hoffmann-La Roche Inc. Modified solid supports for solid phase synthesis. 3,814,732, Cl. 260-47.0up.

Wang, Tse Lin, to Bell Telephone Laboratories, Incorporated. Error detection system. 3,814,923, Cl. 235-153.0bd.

Wanger, Robert Pierce, to General Electric Company. Propulsion nozzle and actuator system employed herein. 3,814,324, Cl. 239-265.310.

Ward, Frederick Edmund, to Miles Laboratories, Inc. Process for preparing bicyclo alkyl derivatives. 3,814,767, Cl. 260-268.0bc.

Ward, Laird Gordon Lindsay: *See—*
Jordan, David Paul; and Ward, Laird Gordon Lindsay, 3,814,638.

Ward, Maurice Leonard, to Metalcraft (Bristol) Limited. Metal box structure and components therefor. 3,814,280, Cl. 220-71.000.

Wardill, Gordon Agar; Taube, David Carl; and Cornell, Alan Ananias, to Piggy-Back Trailer Rental Limited and Gordon. Trailer coupling means. 3,814,464, Cl. 280-476.00r.

Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, to GTE International Incorporated. Assemblies of electrical components. 3,814,990, Cl. 317-122.000.

Warner, G. Scott: *See—*
Lubarsky, Andre, Jr.; and Warner, G. Scott, 3,814,840.

Warning, Walter B. Spray gun. 3,814,328, Cl. 239-411.000.

Warnock, Merville Lee: *See—*
Edington, John Edward; and Warnock, Merville Lee, 3,814,907.

Warnod, Bertrand Antoine, to KLAXON. Multitone air blast horn. 3,814,050, Cl. 116-140.000.

Warren, William Edward, to Bespak Industries Limited. Inhalation actuated aerosol device for dispensing a metered quanitiy of fluid. 3,814,297, Cl. 222-402.130.

Warszawski, Bernard; Verger, Bernard; and Demange, Philippe, to Society Generale de Constructions Electriques et Mechaniques (Alsthom). Framed electrodes containing means for supplying or draining liquid along the edge of an electrode. 3,814,631, Cl. 136-8.00d.

Wartburg, David H.: *See—*
Bucher, Hans R.; and Wartburg, David H., 3,814,849.

Wartes, Christopher R.: *See—*
Howard, Jack D.; Seiffert, Stanley V.; and Wartes, Christopher R., 3,814,105.

Warwick Electronics Inc.: *See—*
Rusk, George R., 3,814,981.

Wasag Chemie GmbH: *See—*
Kraemer, Stefan; Seger, Michael; and Seidl, Alois, 3,814,614.

Wasley, William L.: *See—*
Pittman, Allen G.; Wasley, William L.; and Jones, Carloton C., 3,814,578.

Watanabe, Shigeki: *See—*
Ozawa, Naosuke; Sudo, Tachio; and Watanabe, Shigeki, 3,813,921.

Watatani, Yoshizumi; and Mohri, Katsuo, to Hitachi, Ltd. Voltage controlled oscillator. 3,815,052, Cl. 331-117.00r.

Waters, William Eugene. Hydrogas lift system. 3,814,545, Cl. 417-90.000.

Watton, John F.: *See—*
Ryntz, Edward F., Jr.; Janowak, John F.; and Watton, John F., 3,813,944.

Watts, Leonard, to Technicon Instruments Corporation. Method and apparatus for continuous castings. 3,814,166, Cl. 164-73.000.

Waukesha Bearings Corporation: *See—*
Gardner, Willis W., 3,814,487.

Way, Allan S., to Beckman Instruments, Inc. Precision temperature controller. 3,814,957, Cl. 307-310.000.

Wayland, Paul O.: *See—*
Cherry, Sidney J.; and Wayland, Paul O., 3,814,881.

Wean United, Inc.: *See—*
Miller, Paul W., 3,814,243.

Weatherhead Company, The: *See—*
Courtot, Louis B., 3,814,138.

Weber, Heinz Paul: *See—*
Tomlinson, Walter John, III; and Weber, Heinz Paul, 3,814,498.

Weber, John L.; and Klimas, George C., to Alliance Tool & Die Corporation. Polishing machine for the like with a removable platen. 3,813,825, Cl. 51-129.000.

Weber, Otto K., to Sensor Technology, Inc. Optical transducer having rectilinear fiber optic array including interdigitated light source and sensor associated fibers. 3,814,933, Cl. 250-227.000.

Wedding, Brent M.: *See—*
Lawless, William N.; and Wedding, Brent M., 3,814,999.

Weeson, Anthony Frazer: *See—*
Eweson, Eric W.; and Weeson, Anthony Frazer, 3,814,588.

Wehr Corporation: *See—*
Wooldridge, James E.; and Martin, Ronald P., 3,813,843.

Wei, Peter H. L., to American Home Products Corporation. Imidazo, pyrimido and idazepino benzothiazolecarboxylic acid esters. 3,814,759, Cl. 260-251.00a.

Weikert, Roy J. Filling and sealing system. 3,813,845, Cl. 53-37.000.

Weill, Robert L.; and Parsons, George B., to Skydyne, Inc. Bonding technique. 3,814,655, Cl. 156-293.000.

Weinberg, Stanley. Timing control device. 3,814,949, Cl. 307-141.000.

Weis, Frank G., to Ecodyne Corporation. Pump. 3,814,551, Cl. 417-424.000.

Weiss, Felicia R.; and Weiss, Harry M. Facial tissue. 3,814,096, Cl. 128-260.000.

Weiss, Harry M.: *See—*
Weiss, Felicia R.; and Weiss, Harry M., 3,814,096.

Weiss, Lowell Warner; and Fitzgerald, Clendon Hart, to Sweeney, B. K., Manufacturing Co. Dynamic torque indicators. 3,813,933, Cl. 73-136.00a.

Weissfloch, Carl F.: *See—*
Bosisio, Renato G.; Wertheimer, Michael R.; and Weissfloch, Carl F., 3,814,983.

Welch, John A.: *See—*
Britton, James E.; Welch, John A.; and Hein, Richard D., 3,814,412.

Welch, Stanley B., to General Electric Company. Food temperature monitoring apparatus. 3,815,113, Cl. 340-228.00r.

Welding Research, Inc.: *See—*
Sciaky, Albert M., 3,814,896.

Wells, Warren A.: *See—*
Clark, John A.; and Wells, Warren A., 3,814,522.

Welsh, Richard E., to Dentsply Research & Development Corporation. Adjustable mercury dispenser. 3,814,286, Cl. 222-43.000.

Wenta, Peter J.: *See—*
Harrell, Bob G.; Wenta, Peter J.; and Linsin, Russell J., 3,813,743.

Wentzell, Ralph H.: *See—*
Masters, Cardinal M.; Reed, Willard H.; and Wentzell, Ralph H., 3,813,797.

Wertheimer, Harry P., to Bendix Corporation, The. Exhaust gas recirculation flow control system. 3,814,070, Cl. 123-119.00a.

Wertheimer, Michael R.: *See—*
Bosisio, Renato G.; Wertheimer, Michael R.; and Weissfloch, Carl F., 3,814,983.

West, Patricia Ann: *See—*
Baker, Lionel Richard; Archer, Peter Robert; and West, Patricia Ann, 3,814,943.

Wester, Aaron H., to Texas Instruments Incorporated. General-purpose array processor. 3,815,095, Cl. 340-172.500.

Western Electric Company, Incorporated: *See—*
Miller, Harry Lloyd, 3,814,870.
Rackus, John Joseph; Skilbeck, John Paul; and Szkudlapski, Alfons Henryk, 3,814,117.

Western, William John Taylor. Open-top shell molding apparatus. 3,814,372, Cl. 249-65.000.

Westerwalder Eisenwerk Gerhard KG: *See—*
Gerhard, Helmut, 3,814,290.

Westinghouse Air Brake Company: *See—*
Coiner, Ronald W.; Bridigum, Robert J.; and Brown, Donald, 3,814,483.

Westinghouse Electric Corporation: *See—*
Bennett, Allan I., 3,813,828.
Booker, Clyde A., Jr., 3,814,214.
Brewer, Joe E., 3,815,124.
Cherry, Sidney J.; and Wayland, Paul O., 3,814,881.
Cleaveland, Charles M., 3,814,887.
Clemente, Stefano; and Pelly, Brian R., 3,815,002.
Cookson, Alan H.; Farish, Owen; and Gauntz, John M., 3,814,879.
Grunert, Kurt A.; and Dauer, John J., Jr., 3,815,063.
Harrold, Ronald T., 3,814,882.
Helms, James K.; and Fischer, Robert K., 3,814,893.
Hundstad, Richard L., 3,814,880.
Jones, Calvin C., 3,815,134.
Livera, Phillip A., 3,814,788.
Maier, Alfred E.; and Stephenson, William I., Jr., 3,815,064.
Milianowicz, Stanislaw A., 3,814,883.
Morrison, Heber J., 3,815,030.
Peake, Charles C.; and Bolan, Harry H., 3,813,749.
Pisatowski, Albert J., 3,814,216.
Ramsey, James E., Jr.; and Griffin, Auburn K., Jr., 3,815,027.
Safiuddin, Mohammed; and Morrison, Gary L., 3,814,310.
Spoelman, Leonard A., 3,815,059.

Weston, Donald E.; and Kupetis, Raymond F., to Porter, H. K., Company, Inc. Circuit breaker operating mechanism. 3,814,878, Cl. 200-144.00b.

Weston Instruments, Inc.: *See—*
Kishel, Joseph F., 3,814,183.

Westrich, James L., to Algoma Net Company. Beverage container. 3,814,288, Cl. 222-129.000.

Wetzler, Dallas G.: *See—*
United States of America, National Aeronautics and Space Administration, 3,814,350.

Weyerhaeuser Company: *See—*
Redd, Michael Eugene; and Ricke, Robert Clyde, 3,814,041.

Wheatley, Carl Franklin, Jr., to RCA Corporation. Current translating circuits. 3,815,037, Cl. 330-19.000.

Wheeler, Harold E. Tool holder for boring and turning polygonal shaped surfaces. 3,813,969, Cl. 82-19.000.

Whitaker, Reginald L.; and Smith, Herbert Q., to Pennwalt Corporation. 3,5-Dichloro-2-pyridoxyethyl ethers as herbicides. 3,814,774, Cl. 260-297.00r.

White, Charles R., to General Motors Corporation. Clutch piston assembly having unitary elastomeric cushion ring and lip seal. 3,814,226, Cl. 192-85.0aa.

Whitecar, Alten E., to Smithkline Corporation. Speed changer. 3,813,956, Cl. 74-219.000.

Whited, Charles A., to Xerox Corporation. Humidity compensated control device. 3,814,516, Cl. 355-3.0dd.

Whitfield, Edwin W., to Sperry Rand Corporation. Laser data transmitter with wide frequency bandwidth. 3,814,929, Cl. 250-199.000.

Whitten, Frank R.: *See*—
Urbanosky, Harold J.; and Whitten, Frank R., 3,813,936.

Wiart, Albert, to Jeumont-Schneider. Combined switch and chopper for supplying an A.C. motor. 3,815,003, Cl. 318-216.000.

Wichers, Robert A. Film-mount assembly. 3,814,518, Cl. 355-75.000.

Wick, Richard; and Winkler, Alfred, to Agfa-Gevaert AG. Cassette with photographic roll film. 3,815,147, Cl. 354-203.000.

Wickens, James Charles: *See*—
Osbond, John Mervyn; and Wickens, James Charles, 3,814,805.

Widdel, John E. Pizza pie crust device. 3,814,005, Cl. 99-349.000.

Wiedmann, Siegfried Kurt. Flip-flop memory cell arrangement. 3,815,106, Cl. 340-173.0ff.

Wiegert, Philip E.: *See*—
Hoey, George B.; Peckels, Donald R.; and Wiegert, Philip E., 3,814,769.

Wildrick, Milton I.: *See*—
Coppola, Patrick S.; Sunderland, Luther D.; and Wildrick, Milton I., 3,813,990.

Wilensky, Samuel, to Hybrid Systems Corporation. Current mode digital-to-analog converter. 3,815,121, Cl. 340-347.0da.

Wiles, Michael Frederick: *See*—
Nash, Harold Garth; and Wiles, Michael Frederick, 3,814,918.

Wiles, Sydney T., to Electronic Associates of Canada Ltd. Microwave low moisture measuring apparatus. 3,815,019, Cl. 324-58.50a.

Wiley, Donald F., to Cosden Oil & Chemical Company. Method of forming foamed polystyrene articles from polystyrene beads. 3,814,779, Cl. 264-53.000.

Wilkhahn Wilkening Hahne: *See*—
Slabon, Siegfried; Kasten, Ludwig; and Ritz, Wilhelm, 3,814,475.

Wilkins, Ronald D.: *See*—
Swander, Kenneth D., Jr.; and Wilkins, Ronald D., 3,813,994.

Williams, Eirug Ellis: *See*—
Bemrose, Colin Raymond; Hall, William Arthur; and Williams, Eirug Ellis, 3,813,752.

Williams, Frank N., to Federal-Huber Corporation. Lavatory with integrally molded fixture. 3,813,706, Cl. 4-187.00r.

Williams, Joel L.; and Stannett, Vivian T., to Stevens, J. R., & Co., Inc. Radiation process of preparing grafted electomeric fibers wherein post-decrystal-ization is employed. 3,814,676, Cl. 204-159.120.

Williams, Thomas Llewellyn: *See*—
Baker, Lionel Richard; Biddles, Barry John; and Williams, Thomas Llewellyn, 3,814,520.

Williams, Warren Lee: *See*—
Dickson, Frederick Stoever, III; and Williams, Warren Lee, 3,814,341.

Wilmers, Gottlieb; and Hillinger, Hermann. Oil seal construction for rotary engines. 3,814,556, Cl. 418-142.000.

Wilson, Alan Donald; and Kent, Brean Ernest. Poly(carbocylic acid)-fluoroaluminosilicate glass surgical cement. 3,814,717, Cl. 260-29.60m.

Wilson, Dennis L., to United States of America, Air Force. Burst phase shift keyed receiver. 3,815,029, Cl. 325-320.000.

Wilson, Geoffrey R.: *See*—
Christman, Robert D.; McKinney, Joel D.; and Wilson, Geoffrey R., 3,814,683.

Wilson, Peter C.; and Hughart, Robert P., 50% each to Fiberfuge Company and Centrifugal and Mechanical Industries, Inc. Method for centrifugally removing liquid from a mixture. 3,814,246, Cl. 210-78.000.

Wilson, William L., 10% each to Terry, Virgil P. and Downing, Frank O. Dragline cleaner for open drainage ditches. 3,814,190, Cl. 172-26.500.

Winchester, John E.; and Rawson, Edward B., to Scarle Medidata, Inc. Self-clocking system utilizing guaranteed bit transition. 3,815,100, Cl. 340-172.500.

Windett, Robert Michael; and Martin, Anthony John, to Ford Motor Company. Energy absorbing steering column. 3,813,960, Cl. 74-492.000.

Winkler & Dunnebier: *See*—
Stemmler, Kurt, 3,814,055.

Winkler, Alfred: *See*—
Wick, Richard; and Winkler, Alfred, 3,815,147.

Winkley, Jerry H., to ACF Industries, Incorporated. Carburetor with combined piston motor and diaphragm motor choke valve actuation. 3,814,390, Cl. 261-39.00b.

Winquist, S. William. Symbolically reinforced golf club head. 3,814,437, Cl. 273-167.00r.

Winzen Research, Inc.: *See*—
Nelson, Jean R., 3,814,353.

Wittmann, Thomas J., to Systems Technology Corporation. Method and apparatus for incinerating liquids. 3,814,568, Cl. 431-7.000.

Witzel, Bruce E.: *See*—
Shen, Tsung-Ying; and Witzel, Bruce E., 3,814,771.

Wojtowicz, Edward A., to Burroughs, Corporation. Linear to linear motion apparatus including a bidirectional spring clutch having means to inhibit automatic shifting. 3,813,953, Cl. 74-89.170.

Wolczek, Walter: *See*—
Martone, Ronald J.; Goldman, Samuel C.; and Wolczek, Walter, 3,814,938.

Wolf, Alby H.: *See*—
Oswald, Thomas L.; and Wolf, Alby H., 3,813,922.

Wolf, William D., to Monsanto Company. Forming deep articles having relatively balanced molecular orientation. 3,814,784, Cl. 264-89.000.

Wolfe, John E.; Ledges, George E.; and Glascock, Homer H., to General Electric Company. Electron emission system. 3,814,975, Cl. 313-336.000.

Wolff, David F., to Yorktown Industries, Inc. Adjustable cut-off gauging device. 3,813,975, Cl. 83-205.000.

Wolthuis, Roger A.: *See*—
United States of America, National Aeronautics and Space Administration, 3,814,083.

Wood, Brian. Archery bow with force balancing structure associated with the handgrip. 3,814,074, Cl. 124-24.00r.

Wood, M. Dale, 40% to Meltzer, Harold. Process and apparatus for purification of materials. 3,814,680, Cl. 210-64.000.

Wood, Obert Reeves, III: *See*—
Smith, Peter William; and Wood, Obert Reeves, III, 3,815,047.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,814,238, Cl. 206-167.000.

Wood, William Robert, to Deere & Company. Mobile stack-forming implement. 3,813,861, Cl. 56-344.000.

Woodhall, Edwin S., to Goodyear Tire & Rubber Company, The. Process for molding foamed polyurethane articles involving the use of multiple pouring devices. 3,814,780, Cl. 264-54.000.

Woods, Charles R.: *See*—
Rand, Douglas R.; Iinney, Richard D.; Woods, Charles R.; and Smith, Edward M., 3,813,980.

Woods, Richard E.; and Hohman, William H., to Franklin Electric Co., Inc. System to deenergize motor responsive to current. 3,815,006, Cl. 318-474.000.

Woodward Governor Company: *See*—
Gillespie, Sidney L., 3,814,072.

Wooldridge, James E.; and Martin, Ronald P., to Wehr Corporation. Method and apparatus for rolling cut filter pad. 3,813,843, Cl. 53-21.0fw.

Wootten, Homer C. Method and apparatus for retarding ice formation in an ice fishing hole. 3,813,891, Cl. 62-56.000.

Wortley, Stewart W. Lost motion adjustment device for reciprocal elements. 3,813,963, Cl. 74-828.000.

Wostl, Wolfgang J., to Atlantic Richfield Company. Vehicle fueling apparatus. 3,814,148, Cl. 141-98.000.

Wright, Barry, Corporation: *See*—
Dean, Carl J.; and Wright, David M., 3,814,490.

Wright, David M.: *See*—
Dean, Carl J.; and Wright, David M., 3,814,490.

Wurzburger, Paul D. Pressure-balanced plug valve. 3,814,378, Cl. 251-283.000.

Wutz, Max; and Sinn, Hartmut, to Heraeus-Christ GmbH. Centrifuge with lubrication system therefor. 3,814,306, Cl. 233-24.000.

Wyatt, Philip J.: *See*—
Phillips, David T.; Brooks, Herman H.; Wyatt, Philip J.; and Liu, Chelcie B., 3,815,000.

Wygasch, Ewald, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Purifying gases containing mercury or mercury and oxygen as impurities. 3,814,799, Cl. 423-210.000.

Xerox Corporation: *See*—
Douglas, James R.; Adams, Lloyd M.; Mycek, Edward G.; and Grafton, David A., 3,814,514.
Whited, Charles A., 3,814,516.

Xomox Corporation: *See*—
Schmidt, Peter James, 3,814,777.

Yabuuchi, Hiroshi: *See*—
Kawasumi, Shohachi; Hirooka, Masaaki; and Yabuuchi, Hiroshi, 3,814,734.

Yagi, Kazuharu: *See*—
Suzuki, Hiroshi; Iriuchijima, Makoto; Nakamura, Koichi; and Yagi, Kazuharu, 3,814,724.

Yagi, Yoshiharu; Narisawa, Shizuo; Oshima, Takao; and Hata, Kazuhiko, to Sumitomo Chemical Company, Limited. Process for producing butadiene polymer. 3,814,744, Cl. 260-94.300.

Yamabe, Masahiro: *See*—
Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,814,561.

Yamada, Kiyoshi; Kobayashi, Tadashi; and Morisue, Kazuschige, to Matsushita Electric Works, Ltd. Electric equipment channel. 3,814,833, Cl. 174-48.000.

Yamada, Mitsumasa: *See*—
Inoue, Tokuta; Yamada, Mitsumasa; Nakanishi, Kiyoshi; Tanasawa, Yasushi; and Yamaguchi, Shunzo, 3,813,879.

Yamada Yuki Seizo Co., Ltd.: *See*—
Ito, Jinichi, 3,813,948.

Yamagishi, Kazuo: *See*—
Sasaki, Hajime; Yamagishi, Kazuo; Sakai, Sukeyoshi; and Hoshi, Toshihiro, 3,813,767.

Yamaguchi, Norihisa: *See*—
Iribe, Seiki; Yamaguchi, Norihisa; and Kobayashi, Tukasa, 3,814,141.

Yamaguchi, Shunzo: *See*—
Inoue, Tokuta; Yamada, Mitsumasa; Nakanishi, Kiyoshi; Tanasawa, Yasushi; and Yamaguchi, Shunzo, 3,813,879.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Nakatani, Tsugio, 3,814,073.

Yamamoto, Kazuyoshi: *See*—
Inoue, Kozo; Hara, Toshito; Kitazawa, Takeo; Yamamoto, Kazuyoshi; and Oguma, Toshiro, 3,814,612.

Yamana, Takashi: *See*—
Yamaoka, Takao; Sasaki, Osamu; and Yamana, Takashi, 3,814,649.

Yamaoka, Takao; Sasaki, Osamu; and Yamana, Takashi, to Sekisui Jushi Kabushiki Kaisha. Apparatus for covering elongate members. 3,814,649, Cl. 256-463.000.

Yamashita, Tsutomu: *See*—
Tanaka, Eihachiro; Onodera, Yutaka; Fukuda, Takeji; Yamashita, Tsutomu; and Kuma, Shoji, 3,813,764.

Yang, Jih Hsin; and Olsen, Robert A., to Procter & Gamble Company, The. Meat analogs having the fiber structure of meat. 3,814,823, Cl. 426-362.000.

Yasusaka, Kazuo; and Nagano, Shigemichi, to Nippon Electric Company, Limited. Doppler radar equipment with interference preventing apparatus. 3,815,133, Cl. 343-8.000.

Yata, Kotaro; Nanba, Yasuhiro; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Electrical exposure control devices for use with a photographic camera. 3,815,148, Cl. 354-24.000.

Yeager, Garlen F. Power ventilated helmet. 3,813,696, Cl. 2-171.300.

Yingst, Thomas O.: *See*—
Stoltz, James P.; Bruckner, James V.; and Yingst, Thomas O., 3,814,282.

Yokokawa, Kiyoshi; and Tanaka, Yasuhisa, to Shinetsu Chemical Company. Heat-shrinkable and flame-retardant silicone rubber compositions. 3,814,723, Cl. 260-37.0sb.

Yopp, John, to Union Tank Car Company. Combination steel and teflon seat. 3,814,381, Cl. 251-315.000.

Yorktown Industries, Inc.: *See*—
Wolff, David F., 3,813,975.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Fukuroi, Takeo, 3,813,736.

Yoshida, Yoshitaka: *See*—
Kimbara, Motoyasu; and Yoshida, Yoshitaka, 3,814,068.

Young, David E., to Schlumberger Technology Corporation. Ambient pressure responsive safety valve. 3,814,181, Cl. 166-224.00s.

Young, Douglas L. G., to Canadian Ingersoll-Rand Company, Limited. Apparatus for fractionating fluid suspensions. 3,814,244, Cl. 209-273.000.

Young, Emil O.: *See*—
Gerhauser, Merton F.; and Young, Emil O., 3,814,312.

Young, Gladys R.: *See*—
Gerhauser, Merton F.; and Young, Emil O., 3,814,312.

Young Regulator Company: *See*—
Gerhauser, Merton F.; and Young, Emil O., 3,814,312.

Young, William R.: *See*—
Aviram, Arieh; Haller, Ivan; Miller, Robert D.; and Young, William R., 3,814,700.

Yount, Joseph G., Jr.: *See*—
Hubble, David H.; and Yount, Joseph G., Jr., 3,814,613.

Yukami, Noboru: *See*—
Otani, Hiroshi; and Yukami, Noboru, 3,814,897.

Zagar, Frank G. Stabilizing means for multiple spindle drive. 3,813,951, Cl. 74-63.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Podssuweit, Klaus; and Felder, Winfried, 3,814,224.

Zalbide, Angel de Urruticoechea: *See*—
Miguel, Francisco Angel de Iturribarria; and Zalbide, Angel de Urruticoechea, 3,813,941.

Zanini, Peter, to Arrow-Hart, Inc. Motor control circuit. 3,814,986, Cl. 317-13.00r.

Zankowsky, Matthew S.; and La Patta, Robert A. Barbecue grill with grill height adjustment means. 3,814,076, Cl. 126-25.00a.

Zavaglia, Edmund A.: *See*—
Kowalski, Edward W.; and Plesich, Marion F., 3,814,716.

Zelikovitz, Joseph. Air deflector for vehicle. 3,814,472, Cl. 296-1.00s.

Zellweger Ltd.: *See*—
Kleindienst, Horst; Roos, Gerold; and Zingg, Rudolf, 3,813,930.

Zenith Radio Corporation: *See*—
Tamkin, Michael S., 3,814,989.

Zeunen, Barthel; Grace, Rex C.; and Dunn, Alvie R., to Capital Reproductions Inc. Photographic exposure apparatus. 3,814,519, Cl. 355-103.000.

Zimmerman, Daniel; and Isaacson, Robert B., to Celanese Corporation. Polyalkylene terephthalate molding resin. 3,814,725, Cl. 260-40.00r.

Zingg, Rudolf: *See*—
Kleindienst, Horst; Roos, Gerold; and Zingg, Rudolf, 3,813,930.

Zink, John, Company: *See*—
Zink, John Smith; Reed, Robert D.; and Goodnight, Hershel E., 3,814,567.

Zink, John Smith; Reed, Robert D.; and Goodnight, Hershel E., to Zink, John, Company. Smokeless flare using liquid water particles. 3,814,567, Cl. 413-4.000.

Zinser-Textilmaschinen GmbH: *See*—
Hohloch, Kurt, 3,813,865.

Zlupko, John E.: *See*—
Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., 3,814,620.

Zola, Charles L.: *See*—
Frey, Irwin K.; and Zola, Charles L., 3,814,900.

Zoufaly, Jerome: *See*—
Leach, Jack; Zoufaly, Jerome; and Fash, William G., 3,814,016.

Zumbach, Heinz: *See*—
Nopper, Peter; Zumbach, Heinz; and Brunner, Mathias, 3,815,017.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JUNE, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bills, Max E., and H. J. Hansen, Jr., to U.S. Steel Corp. Cold rolling work roll. Re. 28,027, 6-4-74, Cl. 29—121.

Corning Glass Works: *See*—
Keck, Donald B., Schultz, and Zimar. Re. 28,029.
Maurer, Robert D. Re. 28,028.

Fork, Frank W., to H. H. Robertson Co. Hold-down means for underfloor access housing. Re. 28,035, 6-4-74, Cl. 174—49.

Fortier, Andre. Fluid device for stabilizing the position of a moving element. Re. 28,031, 6-4-74, Cl. 308—5.

Gray, Allan Poe, to Mallinckrodt Chemical Works. N-alkylsulfinylalkyl- and sulfonylalkyl-1,2,3,4-tetrahydroisoquinolines. Re. 28,034, 6-4-74, Cl. 260—283.

Hannon, Joseph E. Calculator for making patterns. Re. 28,033, 6-4-74, Cl. 235—70.

Hansen, Henry J., Jr.: *See*—
Bills, Max E., and Hansen. Re. 28,027.

Honeywell Inc.: *See*—
Scott, Myrsyl W., and Stelzer. Re. 28,032.

Keck, Donald B., P. C. Schultz, and F. Zimar, to Corning Glass Works. Method of forming optical waveguide fibers. Re. 28,029, 6-4-74, Cl. 65—3.

Mallinckrodt Chemical Works: *See*—
Gray, Allan P. Re. 28,034.

Maurer, Robert D., to Corning Glass Works. Method of forming an economic optical waveguide fiber. Re. 28,028, 6-4-74, Cl. 65—3.

Porter, Clyde R., and J. A. Sember, to P. L. Porter Co. Hydraulic control assembly. Re. 28,030, 6-4-74, Cl. 60—54.50.

Porter, P. L., Co.: *See*—
Porter, Clyde R. and Sember. Re. 28,030.

Robertson, H. H., Co.: *See*—
Fork, Frank W. Re. 28,035.

Rosenbaum, Harold, Baseball glove. Re. 28,036, 6-4-74, Cl. 2—19.

Schultz, Peter C.: *See*—
Keck, Donald B., Schultz, and Zimar. Re. 28,029.

Scott, Myrsyl W., and F. L. Stelzer to Honeywell Inc. Multicolor photovoltaic device. Re. 28,032, 6-4-74, Cl. 250—211.

Sember, Joseph A.: *See*—
Porter, Clyde R., and Sember. Re. 28,030.

Stelzer, Ernest L.: *See*—
Scott, Myrsyl W., and Stelzer. Re. 28,032.

U.S. Steel Corp.: *See*—
Bills, Max E., and Hansen. Re. 28,027.

Zimar, Frank: *See*—
Keck, Donald B., Schultz, and Zimar. Re. 28,029.

LIST OF PLANT PATENTEES

Bringhurst, Royce S., and V. Voth, to The Regents of the University of California. Strawberry plant. 3,561, 6-4-74, Cl. 48.

Hegg, Thormod. Poinsettia plant. 3,564, 6-4-74, Cl. 86.

Moore, Ralph S. Rose plant. 3,562, 6-4-74, Cl. 24.

Moore, Ralph S. Rose plant. 3,563, 6-4-74, Cl. 28.

Mordigan, Peter, to Select Nurseries, Inc. Juniper plant. 3,565, 6-4-74, Cl. 50.

Regents of the University of California, The: *See*—
Bringhurst, Royce S., and Voth. 3,561.

Select Nurseries, Inc.: *See*—
Mordigan, Peter. 3,565.

Voth, Victor: *See*—
Bringhurst, Royce S., and Voth. 3,561.

LIST OF DESIGN PATENTEES

Aiuppa, David. Checker and chessboard. 231,746, 6-4-74, Cl. D34—5.

American Hospital Supply Corp.: *See*—
Sendra, Jose F., and Fernandes. 231,734.

Bailey, Gail H. Game target. 231,744, 6-4-74, Cl. D34—5.

Bell Telephone Laboratories, Inc.: *See*—
Genaro, Donald M., McGarvey, and Sylvester. 231,742.

Bom, Cornelis J. G.: *See*—
Van der Lely, Ary, and Bom. 231,748.

Brass, Robert. Educational geometry ring. 231,738, 6-4-74, Cl. D25—1.

Brass, Robert. Game wheel. 231,745, 6-4-74, Cl. D34—5.

Bridgestone Tire Co. Ltd.: *See*—
Ishibashi, Hiroshi. 231,732.

Broyhill, Roy F. Mobile sprayer. 231,736, 6-4-74, Cl. D23—18.

Buell, Bruce A.: *See*—
Wolf, Arnold, Buell, and Howe. 231,740.

Chromally American Corp.: *See*—
Gottlieb, William. 231,717.

Concept, Inc.: *See*—
Tanner, Terry F. 231,737.

Continental Can Co., Inc.: *See*—
Hasegawa, Gary, and Mascia. 231,729.

Crown Controls Corp.: *See*—
Tomkins, David DeW. 231,741.

Davis, Gary L. Sprouting box. 231,747, 6-4-74, Cl. D35—3.

Deesen, Paul H., M. W. Lathers, K. W. Madill, and P. Ollier, to General Motors Corp. Vehicle body. 231,731, 6-4-74, Cl. D12—100.

Deuchler, Robert: *See*—
Zampetti, Patrick and Deuchler. 231,750.

Dilyard, Richard D., to Rubbermaid Inc. Ironing accessories holder. 231,719, 6-4-74, Cl. D6—130.

Eade, Leslie W. Wall-mounted pot lid holder. 231,718, 6-4-74, Cl. D6—114.

Eastern Co., The: *See*—
Pastva, John V., Jr. 231,723.

Fernandes, Joaquim: *See*—
Sendra, Jose F., and Fernandes. 231,734.

Frattini, Gianfranco. Handle for doors and windows. 231,725, 6-4-74, Cl. D8—162.

Fujiwara, Tomio, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 231,753, 6-4-74, Cl. D56—4.

Gauthier, Armond L., to Redkin Laboratories, Inc. Reflectometer. 231,739, 6-4-74, Cl. D26—1.

Genaro, Donald M., J. N. McGarvey, and G. E. Sylvester, to Bell Telephone Laboratories, Inc. Telephone enclosure. 231,742, 6-4-74, Cl. D26—14.

General Motors Corp.: *See*—
Deesen, Paul H., Lathers, Madill, and Ollier. 231,731.

Gottlieb, William, to Chromally American Corp. Combined heel and sole for footwear. 231,717, 6-4-74, Cl. D2—320.

Hasegawa, Gary, and C. T. Mascia, to Continental Can Co., Inc. Can or similar article. 231,729, 6-4-74, Cl. D9—216.

Howe, William E.: *See*—
Wolf, Arnold, Buell, and Howe. 231,740.

Ishibashi, Hiroshi, to Bridgestone Tire Co., Ltd. Vehicle wheel. 231,732, 6-4-74, Cl. D12—209.

Karel, Jerold. Camera. 231,754, 6-4-74, Cl. D61—1.

Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 231,728, 6-4-74, Cl. D9—157.

Lathers, Michael W.: *See*—
Deesen, Paul H., Lathers, Madill, and Ollier. 231,731.

Lee, Robert E., to Lincoln Mfg. Co., Inc. Mobile base for a convection oven. 231,730, 6-4-74, Cl. D12—31.

Lincoln Mfg. Co., Inc.: *See*—
Lee, Robert E. 231,730.

Maciel, David E. Electric lamp or similar article. 231,749, 6-4-74, Cl. D48—20.

Mascia, Carmen T.: *See*—
Hasegawa, Gary, and Mascia. 231,729.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fujiwara, Tomio. 231,753.
Takahashi, Hanji. 231,752.
Takahashi, Hanji, and Takeoka. 231,751.

McGarvey, John N.: *See*—
Genaro, Donald M., McGarvey, and Sylvester. 231,742.

Mockler, Harold R. Combined trash receptacles and cart therefor. 231,722, 6-4-74, Cl. D7—191.

Morgan, Doyle J., to Owens-Illinois, Inc. Jug. 231,727, 6-4-74, Cl. D9—51.

Murphy, Don G. Shelter structure. 231,733, 6-4-74, Cl. D13—1.

Nico, Carl A. Comb. 231,755, 6-4-74, Cl. D86—8.

Nudd, Frederick A. Bird feeder. 231,743, 6-4-74, Cl. D30—13.

Ollier, Piere: *See*—
Deesen, Paul H., Lathers, Madill, and Ollier. 231,731.

Owens-Illinois, Inc.: *See*—
Kretz, Edward J. 231,728.
Morgan, Doyle J. 231,727.
Schweizer, Peter L. 231,726.

Pastva, John V., Jr., to The Eastern Co. Vehicle door lock. 231,723, 6–4–74, Cl. D8—109.
Pearson, Karl H., Jr. Infant feeding fork or the like. 231,721, 6–4–74, Cl. D7—141.
Redkin Laboratories, Inc.: *See*—
Gauthier, Armond L. 231,739.
Riedl, James L. Breech block. 231,735, 6–4–74, Cl. D22—7.
Rubbermaid Inc.: *See*—
Dilyard, Richard D. 231,719.
Saphirwerk AG Nidau: *See*—
Wolff, Max J. 231,720.
Schweizer, Peter L., to Owens-Illinois, Inc. Jug. 231,726, 6–4–74, Cl. D9—40.
Searer, Glenn V. Adjustable lock striker plate. 231,724, 6–4–74, Cl. D8—117.
Sendra, Jose F., and J. Fernandes, to American Hospital Supply Corp. Test tube rack. 231,734, 6–4–74, Cl. D16—1.
Severson, John F. Confection stick. 231,716, 6–4–74, Cl. D1—99.
Sylvester, Gordon E.: *See*—
Genaro, Donald M., McGarvey, and Sylvester. 231,742.
Takahashi, Hanji, and R. Takeoka, to Matsushita Electric Industrial Co., Ltd. Record player. 231,751, 6–4–74, Cl. D56—4.
Takahashi, Hanji, to Matsushita Electric Industrial Co., Ltd. Record player. 231,752, 6–4–74, Cl. D56—4.
Takeoka, Ryoichi: *See*—
Takahashi, Hanji, and Takeoka. 231,751.
Tanner, Terry F., to Concept, Inc. Surgical examination mirror or similar article. 231,737, 6–4–74, Cl. D24—1.
Tomkins, David DeW., to Crown Controls Corp. Controller grip for fork lift trucks or the like. 231,741, 6–4–74, Cl. D26—13.
Van der Lely, Ary, and C. J. G. Bom. Cultivator tine. 231,748, 6–4–74, Cl. D40—1.
Voycell: *See*—
Wolf, Arnold, Buell, and Howe. 231,740.
Wolf, Arnold, B. A. Buell, and W. E. Howe, to Voycell. Telephone intercommunicating unit. 231,740, 6–4–74, Cl. D26—14.
Wolff, Max J. to Saphirwerk AG Nidau. Combined dispensing and display stand for merchandise. 231,720, 6–4–74, Cl. D6—189.
Zampetti, Patrick and R. Deuchler. Grille. 231,750, 6–4–74, Cl. D54—2.

CLASSIFICATION OF PATENTS

ISSUED JUNE 4, 1974

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

19 Re.28,036
153 3,813,694
168 3,813,695
171.3 3,813,696
227 3,813,697
237 3,813,698

CLASS 3

1 3,813,699
3,813,700

CLASS 4

26 3,813,701
172 3,813,702
3,813,703
172.13 3,813,704
172.18 3,813,705
187A 3,813,707
187R 3,813,706
286 3,813,708

CLASS 5

12R 3,813,709
13 3,813,710
24 3,813,711
82 3,813,712
238 3,813,713
332 3,813,714
345R 3,813,715
348R 3,813,716

CLASS 8

115.5 3,814,577
127.6 3,814,578
163 3,814,579
186 3,814,580

CLASS 9

3 3,813,717

CLASS 10

10R 3,813,718

CLASS 12

142RS 3,813,719

CLASS 13

1 3,814,827
18 3,814,828
31 3,814,829

CLASS 15

23 3,813,720
29 3,813,721
104.92 3,813,722
119R 3,813,723
150 3,813,724
347 3,813,725
385 3,813,726

CLASS 16

1 3,813,727
97 3,813,728
119 3,813,729
135 3,813,730

CLASS 17

34 3,813,731

CLASS 23

230B 3,814,584
3,814,585
3,814,586
230M 3,814,587
230R 3,814,581
3,814,582
3,814,583
259.1 3,814,588
288F 3,814,589

CLASS 24

41 3,813,732
49S 3,813,737
81A 3,813,733
200 3,813,734
201SL 3,813,735
205.14R 3,813,736

CLASS 28

1CS 3,813,738
1R 3,813,739
1.6 3,813,740
4R 3,813,741
49 3,813,742

CLASS 29

6.2 3,813,743
25.35 3,813,744
36 3,813,745
96 3,813,746
3,813,747
105R 3,813,748
121R Re.28,027
183 3,814,590
194 3,814,591
202D 3,813,751
3,813,752
202R 3,813,749
203DT 3,813,753
203D 3,813,754
229 3,813,750
252 3,813,755
427 3,813,756
455 3,813,757
470.1 3,813,758
472.7 3,813,759
527.4 3,813,760
583 3,813,761
589 3,813,762
596 3,813,763
599 3,813,764
600 3,813,765
603 3,813,766
604 3,813,767
3,813,768
3,813,769
605 3,813,770
615 3,813,771
624 3,813,772
630R 3,813,773

CLASS 30

43.9 3,813,774
279R 3,813,775
381 3,813,776

CLASS 32

2 3,813,777
3,813,778
13 3,813,779
19 3,813,780
3,813,781
26 3,813,782

CLASS 33

1HH 3,813,784
1SD 3,813,783
169B 3,813,785
174B 3,813,787
174L 3,813,789
174P 3,813,786
241 3,813,790
263 3,813,791
321 3,813,788
356 3,813,792

CLASS 34

57R 3,813,793
136 3,813,794

CLASS 35

25 3,813,795

CLASS 36

2.5AL 3,813,796

CLASS 40

36 3,813,797
70 3,813,798
152 3,813,799
155 3,813,800
306 3,813,801

CLASS 42

1N 3,813,802
16 3,813,803
62 3,813,804

CLASS 43

15 3,813,805
3,813,806
3,813,807
43.13 3,813,809
43.2 3,813,808

CLASS 46

64 3,813,810
180 3,813,811
244R 3,813,812

CLASS 47

36 3,813,813

CLASS 49

220 3,813,814
478 3,813,815

CLASS 51

7 3,813,816
15 3,813,817
34A 3,813,818
39 3,813,819
81 3,813,820
89 3,813,821
90 3,813,822
94CS 3,813,823
101R 3,813,824
129 3,813,825
168 3,813,826
219R 3,813,827
281R 3,813,828
334 3,813,829
392 3,813,830

CLASS 52

189 3,813,831
206 3,813,832
214 3,813,833
223 3,813,834
227 3,813,835
239 3,813,836
309 3,813,837
396 3,813,838
588 3,813,839
619 3,813,840
648 3,813,841
693 3,813,842

CLASS 53

21FW 3,813,843
32 3,813,844
37 3,813,845
39 3,813,846
112B 3,813,847
178 3,813,848
234 3,813,849

CLASS 55

29 3,813,850
52 3,813,851
71 3,813,852
96 3,813,853
399 3,813,854
440 3,813,855
444 3,813,856

CLASS 56

13.1 3,813,857
119 3,813,858
260 3,813,859
328R 3,813,860
344 3,813,861

CLASS 57

1UN 3,813,862
34HS 3,813,863
34TT 3,813,864
34.5 3,813,865
52 3,813,866
77.4 3,813,867
3,813,868
106 3,813,869
156 3,813,870

CLASS 58

23V 3,813,871
28A 3,813,872
85.5 3,813,873

CLASS 60

39.15 3,813,874
39.46 3,813,875
54.5R Re.28,030
284 3,813,877
303 3,813,878
3,813,879
314 3,813,880
521 3,813,881
525 3,813,882
582 3,813,883
657 3,813,884
716 3,813,876

CLASS 61

44 3,813,885
45D 3,813,886
69R 3,813,887
72.6 3,813,888

CLASS 62

22 3,813,889
40 3,813,890
56 3,813,891
58 3,813,892
129 3,813,893
181 3,813,894
266 3,813,895
409 3,813,896

CLASS 64

13 3,813,897
15R 3,813,898
23 3,813,899

CLASS 65

3 Re.28,028
Re.28,029
3,814,592
169 3,814,594
305 3,814,593

CLASS 66

125R 3,813,900
189 3,813,901

CLASS 68

19.1 3,813,902
210 3,813,903

CLASS 70

169 3,813,904
339 3,813,905
363 3,813,906
456R 3,813,907

CLASS 71

61 3,814,595

CLASS 72

16 3,813,908
95 3,813,909
130 3,813,910
208 3,813,911
224 3,813,912
267 3,813,913
318 3,813,914
407 3,813,915

CLASS 73

3 3,813,916
9 3,813,917
15B 3,813,918
15.6 3,813,919
37 3,813,920
40 3,813,921
49.2 3,813,922
3,813,923
53 3,813,924
64.2 3,813,925
67.7 3,813,926
73 3,813,927
76 3,813,928
84 3,813,929
95.5 3,813,930
116 3,813,931
118 3,813,932
136A 3,813,933
141R 3,813,934
153 3,813,935
155 3,813,936
190R 3,813,937
194EM 3,813,938
194E 3,813,939
198 3,813,940
313 3,813,941
343R 3,813,942
3,813,943
354 3,813,944
422TC 3,813,945
430 3,813,946
432PS 3,813,947
460 3,813,948

CLASS 74

5.6A 3,813,949
61 3,813,950
63 3,813,951
84 3,813,952
89.17 3,813,953
194 3,813,954
217B 3,813,955
219 3,813,956
240 3,813,957
425 3,813,958
491 3,813,959
492 3,813,960
3,813,961
500 3,813,962
828 3,813,963
866 3,813,964

CLASS 75

40 3,814,596
123CB 3,814,597
206 3,814,598

CLASS 76

82 3,813,965

CLASS 81

9.5B 3,813,966
60 3,813,967

CLASS 82

4C 3,813,968
19 3,813,969
36R 3,813,970
3,813,971
82 3,813,972

CLASS 83

42 3,813,973
155 3,813,974
205 3,813,975
211 3,813,976
345 3,813,977
401 3,813,978
467 3,813,979
3,813,980
500 3,813,981
602 3,813,982

CLASS 84

458 3,813,983

CLASS 85

33 3,813,984
49 3,813,985
75 3,813,986

CLASS 86

44 3,813,987

CLASS 90

2 3,813,988
11R 3,813,989

CLASS 91

1 3,813,990
31 3,813,991
189 3,813,992
220 3,813,993
471 3,813,994
488 3,813,995

CLASS 93

1C 3,813,996
12C 3,813,997
33H 3,813,998
37R 3,813,999
53SD 3,814,000

CLASS 96

1.4 3,814,599
1.6 3,814,600
27E 3,814,601
29L 3,814,602
33 3,814,603
48R 3,814,604
58 3,814,605
66.1 3,814,606
115P 3,814,607
116 3,814,608
124 3,814,609

CLASS 98

2 3,814,001
115SB 3,814,002

CLASS 99

276 3,814,003
283 3,814,004
349 3,814,005
423 3,814,006
532 3,814,007

CLASS 100

1 3,814,008
159 3,814,009

CLASS 101

90 3,814,010
93C 3,814,011
111 3,814,012
121 3,814,013
137 3,814,014
269 3,814,015

CLASS 102

22 3,814,016
70.2R 3,814,017
78 3,814,018
91 3,814,019

CLASS 104

25 3,814,020
69 3,814,021
89 3,814,022
94 3,814,023
172S 3,814,024
242 3,814,025
246 3,814,026
247 3,814,027

CLASS 105

366R 3,814,028
369A 3,814,029

CLASS 106

16 3,814,610
52 3,814,611
3,814,612
68 3,814,613
97 3,814,614
213 3,814,615

CLASS 108

51 3,814,030
3,814,031
101 3,814,032
108 3,814,033
111 3,814,034

CLASS 110

1F 3,814,035
18R 3,814,036

CLASS 112

68 3,814,037
121.15 3,814,038
153 3,814,039

CLASS 113

120M 3,814,040
121C 3,814,041

CLASS 114

.5T 3,814,042
54 3,814,043
66.5P 3,814,044

CLASS 115

1R 3,814,045
3,814,046
35 3,814,047

CLASS 116

67R 3,814,048
114R 3,814,049
140 3,814,050

CLASS 117

17 3,814,616
34 3,814,617
61 3,814,618
62 3,814,619
71M 3,814,625
93.1PF 3,814,620
114B 3,814,621
126AB 3,814,622
135.5 3,814,623
136 3,814,624
138.8A 3,814,626
138.8F 3,814,627
201 3,814,628
211 3,814,629

CLASS 118

2 3,814,053
49 3,814,051
60 3,814,052
258 3,814,054
410 3,814,055

CLASS 119

14.08 3,814,056
15 3,814,057
19 3,814,058
23 3,814,059
98 3,814,060
106 3,814,061

CLASS 122

6A 3,814,062
3,814,063

CLASS 123

8.17 3,814,064
26 3,814,065
32ST 3,814,067

32A	3,814,068
32R	3,814,066
52M	3,814,069
119A	3,814,070
122H	3,814,071
179L	3,814,072
185A	3,814,073
CLASS 124	
24R	3,814,074
	3,814,075
CLASS 126	
25A	3,814,076
39E	3,814,077
299C	3,814,078
CLASS 128	
2F	3,814,079
2L	3,814,081
2M	3,814,080
2.05A	3,814,083
2.05R	3,814,082
25R	3,814,084
57	3,814,085
66	3,814,086
75	3,814,087
87R	3,814,088
92EB	3,814,089
145A	3,814,090
188	3,814,091
	3,814,092
210	3,814,093
212	3,814,094
260	3,814,095
	3,814,096
268	3,814,097
276	3,814,098
285	3,814,099
287	3,814,100
	3,814,101
321	3,814,102
351	3,814,103
418	3,814,104
419D	3,814,105
419P	3,814,106
480	3,814,107
CLASS 131	
2	3,814,108
243	3,814,109
CLASS 132	
7	3,814,110
9	3,814,111
11R	3,814,112
36R	3,814,113
92A	3,814,114
CLASS 133	
4	3,814,115
CLASS 134	
104	3,814,116
158	3,814,117
CLASS 135	
15PE	3,814,118
CLASS 136	
86A	3,814,630
86D	3,814,631
134R	3,814,632
205	3,814,633
218	3,814,634
CLASS 137	
86	3,814,119
242	3,814,120
329.03	3,814,121
490	3,814,122
493.9	3,814,123
525.3	3,814,124
561R	3,814,125
608	3,814,126
624.11	3,814,127
624.13	3,814,128
625.11	3,814,129
625.28	3,814,130
625.62	3,814,131
625.64	3,814,132
625.65	3,814,133
627.5	3,814,134
CLASS 138	
89	3,814,135
	3,814,136
103	3,814,137
124	3,814,138
141	3,814,139
CLASS 139	
127P	3,814,141
302	3,814,140
420C	3,814,142
CLASS 140	
81.5	3,814,143
107	3,814,144
112	3,814,145
CLASS 141	
1	3,814,146
94	3,814,147
98	3,814,148
231	3,814,149
337	3,814,150
CLASS 144	
2N	3,814,152
2Z	3,814,151
3R	3,814,153
172	3,814,154
219	3,814,155
CLASS 148	
6.3	3,814,640
11.5R	3,814,635
12.1	3,814,636
23	3,814,637
	3,814,638
187	3,814,639
CLASS 151	
14.5	3,814,156
CLASS 152	
17	3,814,157
158	3,814,158
	3,814,159
330	3,814,160
352	3,814,161
361DM	3,814,162
CLASS 156	
11	3,814,641
60	3,814,642
71	3,814,643
78	3,814,644
94	3,814,645
159	3,814,652
195	3,814,646
219	3,814,647
253	3,814,648
285	3,814,653
290	3,814,654
293	3,814,655
380	3,814,656
463	3,814,649
500	3,814,650
541	3,814,651
CLASS 157	
1.1	3,814,163
CLASS 160	
120	3,814,164
207	3,814,165
CLASS 161	
77	3,814,658
144	3,814,657
161	3,814,659
176	3,814,660
191	3,814,661
CLASS 162	
19	3,814,662
60	3,814,663
236	3,814,664
274	3,814,665
CLASS 164	
73	3,814,166
82	3,814,167
114	3,814,168
274	3,814,169
309	3,814,170
CLASS 165	
10	3,814,171
12	3,814,172
	3,814,173
32	3,814,174
96	3,814,175
104	3,814,176
110	3,814,177
158	3,814,178
CLASS 166	
89	3,814,179
99	3,814,180
224S	3,814,181
226	3,814,182
	3,814,183
230	3,814,184
247	3,814,185
272	3,814,186
281	3,814,187
CLASS 172	
7	3,814,188
13	3,814,189
26.5	3,814,190
311	3,814,191
CLASS 173	
44	3,814,192
57	3,814,193
152	3,814,194
CLASS 174	
22C	3,814,830
28	3,814,831
	3,814,832
48	3,814,833
49	Re.28,035
57	3,814,834
70R	3,814,835
84C	3,814,836
88R	3,814,837
150	3,814,838
CLASS 176	
78	3,814,666
87	3,814,667
CLASS 177	
1	3,814,195
54	3,814,196
CLASS 178	
2C	3,814,839
	3,814,840
5.1	3,814,841
5.4MA	3,814,842
5.8AF	3,814,843
6.6P	3,814,844
6.8	3,814,845
7.1	3,814,846
	3,814,847
	3,814,848
7.2	3,814,849
	3,814,850
7.3R	3,814,851
7.5DC	3,814,852
7.85	3,814,853
69.5TV	3,814,854
	3,814,855
CLASS 179	
1AT	3,814,856
1D	3,814,857
15AL	3,814,859
15BA	3,814,860
15BT	3,814,858
15A	3,814,861
18GE	3,814,862
84VF	3,814,865
111R	3,814,864
170G	3,814,866
	3,814,867
175	3,814,869
175.2B	3,814,870
175.3R	3,814,868
CLASS 180	
3R	3,814,197
6A	3,814,198
6.5	3,814,199
41	3,814,200
44R	3,814,201
79.2R	3,814,202
	3,814,203
89	3,814,204
90	3,814,205
116	3,814,206
CLASS 181	
.5LD	3,814,207
33G	3,814,208
36A	3,814,209
CLASS 182	
6	3,814,210
14	3,814,211
CLASS 184	
1E	3,814,212
CLASS 185	
39	3,814,213
CLASS 187	
29R	3,814,214
	3,814,215
	3,814,216
CLASS 188	
72.8	3,814,217
112	3,814,218
282	3,814,219
CLASS 190	
19	3,814,220
CLASS 192	
.084	3,814,224
3.34	3,814,221
4A	3,814,222
46	3,814,223
85AA	3,814,225
	3,814,226
CLASS 195	
103.5C	3,814,668
103.5R	3,814,669
127	3,814,670
CLASS 197	
1R	3,814,227
16	3,814,228
18	3,814,229
60	3,814,230
168	3,814,231
CLASS 198	
19	3,814,232
127R	3,814,233
143	3,814,234
CLASS 200	
6A	3,814,871
33R	3,814,872
38B	3,814,874
44	3,814,873
61.48	3,814,875
61.58R	3,814,876
83N	3,814,877
144B	3,814,878
	3,814,880
	3,814,881
	3,814,882
	3,814,885
144	3,814,879
148B	3,814,884
148G	3,814,883
157	3,814,886
162	3,814,887
CLASS 203	
7	3,814,671
CLASS 204	
12	3,814,672
39	3,814,673
43T	3,814,674
145R	3,814,675
159.12	3,814,676
159.22	3,814,677
180R	3,814,678
CLASS 206	
45.14	3,814,235
72	3,814,236
167	3,814,237
	3,814,238
423	3,814,239
CLASS 208	
15	3,814,679
210	3,814,681
216	3,814,682
	3,814,683
	3,814,684
CLASS 209	
11	3,814,240
80	3,814,241
111.7	3,814,242
223A	3,814,243
273	3,814,244
CLASS 210	
31C	3,814,255
47	3,814,686
49	3,814,687
59	3,814,685
64	3,814,680
74	3,814,245
78	3,814,246
80	3,814,247
83	3,814,248
86	3,814,249
90	3,814,250
	3,814,251
94	3,814,252
97	3,814,253
169	3,814,254
297	3,814,688
323	3,814,256
332	3,814,257
359	3,814,258
391	3,814,259
396	3,814,260
453	3,814,261
519	3,814,262
CLASS 211	
13	3,814,263
CLASS 212	
3	3,814,264
35	3,814,265
CLASS 213	
8	3,814,266
166	3,814,267
CLASS 214	
10	3,814,268
145	3,814,269
302	3,814,270
509	3,814,271
660	3,814,272
CLASS 215	
20	3,814,273
344	3,814,274
CLASS 219	
10.49	3,814,888
10.55	3,814,889
	3,814,890
67	3,814,891
69C	3,814,894
69E	3,814,892
	3,814,893
121EM	3,814,896
121L	3,814,895
212	3,814,899
216	3,814,897
362	3,814,898
385	3,814,900
401	3,814,901
492	3,814,902
CLASS 220	
9LG	3,814,275
39R	3,814,276
42C	3,814,277
60R	3,814,278
66	3,814,279
71	3,814,280
CLASS 221	
5	3,814,281
85	3,814,282
178	3,814,283
301	3,814,284
CLASS 222	
2	3,814,285
43	3,814,286
94	3,814,287
129	3,814,288
135	3,814,289
143	3,814,290
148	3,814,291
153	3,814,298
173	3,814,293
181	3,814,294
189	3,814,292
195	3,814,295
220	3,814,296
402.13	3,814,297
CLASS 226	
162	3,814,299
194	3,814,300
CLASS 229	
17R	3,814,301
23R	3,814,302
38	3,814,303
52AL	3,814,304
92.9	3,814,305
CLASS 233	
24	3,814,306
31	3,814,307
CLASS 235	
61GM	3,814,903
61.11E	3,814,904
	3,814,905
61.12R	3,814,906
70R	Re.28,033
70	3,814,308
92CN	3,814,907
92EA	3,814,908
92MP	3,814,909
130R	3,814,309
150.2	3,814,910
	3,814,912
150.26	3,814,911
151.1	3,814,913
	3,814,914
151.12	3,814,915
	3,814,916
152	3,814,917
	3,814,918
153AC	3,814,920
153AK	3,814,919
	3,814,922
153AM	3,814,921
153BD	3,814,923
164	3,814,924
175	3,814,925
197	3,814,310
CLASS 236	
47	3,814,311
49	3,814,312
93	3,814,313
CLASS 237	
12.3B	3,814,314
31	3,814,315
CLASS 239	
2S	3,814,319
8	3,814,316
18	3,814,317
23	3,814,318
127	3,814,320
135	3,814,321
251	3,814,322
265.17	3,814,323
265.31	3,814,324
265.39	3,814,325
276	3,814,326
290	3,814,327
411	3,814,328
426	3,814,329
558	3,814,330
CLASS 240	
6.4W	3,814,926
54A	3,814,927
57	3,814,928
CLASS 241	
19	3,814,331
38	3,814,332
46B	3,814,333
69	3,814,335
70	3,814,334
79.1	3,814,336
99	3,814,337
CLASS 242	
18PW	3,814,338
	3,814,339
25A	3,814,340
35.5R	3,814,341
56A	3,814,342
56R	3,814,343
74	3,814,344
106	3,814,345
107.2	3,814,346
125.1	3,814,347
158R	3,814,348
217	3,814,349
CLASS 244	
1SS	3,814,350
17.19	3,814,351
77B	3,814,352
98	3,814,353
103S	3,814,354
145	3,814,355
CLASS 248	
18	3,814,356
20	3,814,357
23	3,814,358
99	3,814,359
131	3,814,360
146	3,814,361
188.3	3,814,362
188.4	3,814,363
210	3,814,364
278	3,814,365
286	3,814,366
311	3,814,367
316R	3,814,368
378	3,814,369
400	3,814,370
CLASS 249	
14	3,814,371
65	3,814,372
176	3,814,373
179	3,814,374
CLASS 250	
199	3,814,929
201	3,814,930
211J	Re.28,032
223R	3,814,931
226	3,814,932
227	3,814,933
231SE	3,814,934
231R	3,814,935
295	3,814,936
336	3,814,937
366	3,814,938
373	3,814,939
389	3,814,940
430	3,814,941
456	3,814,942
550	3,814,943
555	3,814,944
571	3,814,945
572	3,814,946
CLASS 251	
28	3,814,375
65	3,814,376
145	3,814,377
283	3,814,378
297	3,814,379
307	3,814,380
315	3,814,381
CLASS 252	
21	3,814,689
56D	3,814,690
78	3,814,691
108	3,814,692
111	3,814,693
186	3,814,694
301.2P	3,814,695
317	3,814,696
359E	3,814,697
370	3,814,698
397	3,814,699
408	3,814,700
412	3,814,701
428	3,814,702
500	3,814,703
522	3,814,704
525	3,814,705
CLASS 254	
10.5	3,814,382
134.3CL	3,814,383
CLASS 256	
10	3,814,384
CLASS 259	
1R	3,814,385
2	3,814,386
72	3,814,387
191	3,814,388
CLASS 260	
2.5AC	3,814,707
2.5P	3,814,706
23XA	3,814,708
23.7A	3,814,709
28	3,814,710
28.5AS	3,814,712
29.3	3,814,713
29.6MN	3,814,714
29.6XA	3,814,715
29.6M	3,814,717
29.6T	3,814,716
32.6N	3,814,719

32.6R 3,814,718
33.4R 3,814,720
33.6R 3,814,721
37SB 3,814,722
3,814,723
40R 3,814,724
3,814,725
42.21 3,814,726
45.75C 3,814,728
45.85R 3,814,729
45.9R 3,814,727
46.5UA 3,814,730
3,814,731
47UP 3,814,732
63R 3,814,734
65 3,814,735
77.5AC 3,814,736
80.73 3,814,737
80.78 3,814,738
85.5R 3,814,739
86.1E 3,814,740
3,814,741
88.1PN 3,814,742
93.7 3,814,743
94.3 3,814,744
112R 3,814,745
112.5 3,814,746
3,814,747
123.5 3,814,748
190 3,814,749
239B 3,814,750
239.55R 3,814,751
240D 3,814,752
242 3,814,753
243C 3,814,754
3,814,755
247.2A 3,814,756
250R 3,814,757
251A 3,814,759
251R 3,814,758
256.4Q 3,814,760
256.5R 3,814,761
3,814,762
260 3,814,763
268BC 3,814,767
268PC 3,814,766
268PE 3,814,765
268T 3,814,764
283S Re.28,034
285 3,814,768
287R 3,814,711
288A 3,814,769
293.56 3,814,770
293.73 3,814,771
293.77 3,814,772
295A 3,814,773
297R 3,814,774
309.5 3,814,775
3,814,776
631.5 3,814,733

CLASS 261

39B 3,814,390
39D 3,814,389
50R 3,814,391
72R 3,814,392
80 3,814,393
83 3,814,394
87 3,814,395
93 3,814,396
114R 3,814,397
115 3,814,398
124 3,814,399

CLASS 264

40 3,814,777
45 3,814,778
53 3,814,779
54 3,814,780
3,814,781
63 3,814,782
89 3,814,783
3,814,784
3,814,785
98 3,814,786
109 3,814,787
111 3,814,788
117 3,814,789
122 3,814,790
164 3,814,791
176R 3,814,792
210F 3,814,793
3,814,794

CLASS 266

1R 3,814,400
4A 3,814,401
16 3,814,402
27 3,814,403
29 3,814,404
34T 3,814,405
36H 3,814,406
37 3,814,407
39 3,814,408

CLASS 267

1.5 3,814,409
47 3,814,410
63R 3,814,411
152 3,814,412

CLASS 269

58 3,814,413
323 3,814,414

CLASS 271

181 3,814,415

CLASS 272

56.5SS 3,814,417
56.5R 3,814,416
3,814,418
80 3,814,419
83R 3,814,420

CLASS 273

1.5A 3,814,421
30 3,814,422
73C 3,814,423
86G 3,814,424
89 3,814,425
94R 3,814,426
95A 3,814,427
95R 3,814,428
102.1E 3,814,429
106D 3,814,431
118R 3,814,430
123R 3,814,432
132 3,814,433
134G 3,814,434
135B 3,814,435
149P 3,814,436
167R 3,814,437
176FA 3,814,438
181R 3,814,439

CLASS 274

10S 3,814,440
23R 3,814,441
39A 3,814,442

CLASS 277

5 3,814,443
139 3,814,444
165 3,814,445
169 3,814,446
224 3,814,447

CLASS 279

1J 3,814,448
3,814,449
4 3,814,450
121 3,814,451

CLASS 280

11.13L 3,814,452
11.17 3,814,453
11.35C 3,814,454
11.35T 3,814,455
43.12 3,814,456
106 3,814,457
150AB 3,814,458
150B 3,814,459
179R 3,814,460
3,814,461
287 3,814,462
406A 3,814,463
476R 3,814,464

CLASS 285

30 3,814,465
55 3,814,466
92 3,814,467
114 3,814,468

CLASS 289

1.5 3,814,469

CLASS 293

70 3,814,470

CLASS 294

3,814,471

CLASS 296

1S 3,814,472
39R 3,814,473

CLASS 297

160 3,814,474
361 3,814,475
379 3,814,476
419 3,814,477
445 3,814,478

CLASS 298

23M 3,814,479

CLASS 299

2 3,814,480
61 3,814,481
79 3,814,482

CLASS 303

3 3,814,483
20 3,814,484
50 3,814,485

CLASS 307

41 3,814,947
141 3,814,948
3,814,949
3,814,950
215 3,814,951
237 3,814,952
289 3,814,953
293 3,814,954
304 3,814,955
309 3,814,956
310 3,814,957

CLASS 308

5 Re.28,031
160 3,814,486
3,814,487
227 3,814,488

CLASS 310

8.1 3,814,958
55 3,814,959
67 3,814,960
87 3,814,961
103 3,814,962
217 3,814,963

CLASS 312

111 3,814,489
183 3,814,490
257R 3,814,491
273 3,814,492
297 3,814,493

CLASS 313

39 3,814,964
95 3,814,968
221 3,814,970
226 3,814,971
296 3,814,972
313 3,814,973
326 3,814,974
336 3,814,975
345 3,814,976
367 3,814,965
408 3,814,966
468 3,814,967
486 3,814,969

CLASS 315

11 3,814,977
3,814,979
27GD 3,814,980
3,814,982
27TD 3,814,978
3,814,981
39 3,814,983
83 3,814,984
241P 3,814,985

CLASS 317

13R 3,814,986
16 3,814,987
31 3,814,988
120 3,814,989
122 3,814,990
141S 3,814,991
246 3,814,998
247 3,814,999
262E 3,815,000

CLASS 318

139 3,815,001
209 3,815,002
211 3,815,003
440 3,815,004
466 3,815,005
474 3,815,006

CLASS 321

2 3,815,007
44 3,815,008
45R 3,815,009

CLASS 322

28 3,815,010

CLASS 323

6 3,815,011
3,815,012
3,815,013
20 3,815,014
22T 3,815,015

CLASS 324

34TK 3,815,016
34R 3,815,017
36 3,815,018
58.5A 3,815,019
61R 3,815,020
3,815,021
71CP 3,815,022
3,815,023
3,815,024
73R 3,815,025
103P 3,815,026
137 3,815,027

CLASS 325

304 3,815,028
320 3,815,029

CLASS 328

27 3,815,030
56 3,815,031
167 3,815,032

CLASS 329

104 3,815,033
3,815,034
136 3,815,035

CLASS 330

4.3 3,815,036
19 3,815,037
30D 3,815,038
51 3,815,039
149 3,815,040
207A 3,815,041

CLASS 331

11 3,815,042
94.5C 3,815,044
94.5G 3,815,043
94.5M 3,815,045
94.5R 3,815,047
94.5 3,815,046
107R 3,815,049
109 3,815,048
110 3,815,050
117R 3,815,051
3,815,052
168 3,815,053

CLASS 333

5 3,815,054
9 3,815,055
30R 3,815,056

CLASS 335

1 3,815,057
8 3,815,058
16 3,815,059
133 3,815,060
145 3,815,061
152 3,815,062
160 3,815,063
176 3,815,064
257 3,815,065
306 3,815,066

CLASS 336

83 3,815,067
100 3,815,068
200 3,815,069

CLASS 337

59 3,815,070
215 3,815,071
226 3,815,072
295 3,815,073

CLASS 338

22R 3,815,074
159 3,815,075
180 3,815,076

CLASS 339

17CF 3,815,077
28 3,815,078
46 3,815,079
52R 3,815,080
217S 3,815,081
221R 3,815,082

CLASS 340

23 3,815,084
41R 3,815,085
52E 3,815,086
53 3,815,087
63 3,815,088
64 3,815,089
146.3MA 3,815,090
147P 3,815,092
147R 3,815,091
152T 3,815,093
172.5 3,815,083
3,815,094
3,815,095
3,815,096
3,815,097
3,815,098
3,815,099
3,815,100
36 3,815,101
3,815,102
3,815,103
3,815,104
3,815,105
173FF 3,815,106
174YC 3,815,107
207R 3,815,109
213R 3,815,110
3,815,111
214 3,815,112
228R 3,815,113
237R 3,815,114
261 3,815,115
267C 3,815,116
280 3,815,117
283 3,815,118
310R 3,815,119
336 3,815,120
347AD 3,815,121
347DA 3,815,123
347DD 3,815,122
347P 3,815,125
3,815,126
365S 3,815,127
366B 3,815,128
388 3,815,129

CLASS 343

5PD 3,815,130
3,815,131
7TA 3,815,132
8 3,815,133
17.1R 3,815,134
113R 3,815,135
117 3,815,136
180 3,815,137
754 3,815,138
775 3,815,139
779 3,815,140
795 3,815,141

CLASS 346

21 3,815,142
3,815,143
35 3,815,144
74EB 3,815,145
137 3,815,146

CLASS 350

6 3,814,494
7 3,814,495
75 3,814,496
96WG 3,814,497
3,814,498
3,814,499
97 3,814,500
150 3,814,502
160LC 3,814,501
160R 3,814,503
167 3,814,504
214 3,814,505
272 3,814,506
285 3,814,507
299 3,814,508
321 3,814,509

CLASS 351

36 3,814,510

CLASS 352

91 3,814,511
178 3,814,512

CLASS 353

7 3,814,513
78 3,814,514

CLASS 354

24 3,815,148
203 3,815,147
223 3,815,149

CLASS 355

3DD 3,814,515
3,814,516
3R 3,814,517
75 3,814,518
103 3,814,519

CLASS 356

71 3,814,520
156 3,814,521
197 3,814,522
202 3,814,523

CLASS 357

22 3,814,995
23 3,814,992
30 3,814,993
3,814,996
43 3,814,994
58 3,814,997

CLASS 360

41 3,815,108
97 3,815,150
113 3,814,863
114 3,815,151

CLASS 401

57 3,814,524
190 3,814,525
199 3,814,526
406 3,814,549
413 3,814,552
417 3,814,550
424 3,814,551
511 3,814,553

CLASS 418

73 3,814,554
99 3,814,555
142 3,814,556
197 3,814,557

CLASS 423

210 3,814,799
644 3,814,813

CLASS 424

19 3,814,809
116 3,814,795
117 3,814,796
128 3,814,797
200 3,814,798
248 3,814,810
271 3,814,800
273 3,814,801
3,814,802
286 3,814,803
295 3,814,804
306 3,814,805
309 3,814,811
318 3,814,812
324 3,814,806
343 3,814,807
360 3,814,808

CLASS 425

7 3,814,558
72 3,814,559
104 3,814,560
131 3,814,561
144 3,814,566
174.4 3,814,562
203 3,814,563
383 3,814,564
392 3,814,565

CLASS 426

2 3,814,814
3 3,814,815
46 3,814,816
56 3,814,817
65 3,814,818
72 3,814,819
262 3,814,820
265 3,814,821
293 3,814,822
342 3,814,824
361 3,814,825
362 3,814,823
388 3,814,826

CLASS 431

4 3,814,567
7 3,814,568
29 3,814,569
76 3,814,570
132 3,814,571
143 3,814,572
329 3,814,573
338 3,814,574
352 3,814,575
354 3,814,576

CLASS 402

3 3,814,527

CLASS 403

256 3,814,528
393 3,814,529

CLASS 404

67 3,814,530
117 3,814,531
3,814,532
133 3,814,533

CLASS 408

26 3,814,534
73 3,814,535
157 3,814,536

CLASS 415

36 3,814,537
182 3,814,538

CLASS 416

95 3,814,539
226 3,814,540

CLASS 417

7 3,814,541
12 3,814,542
26 3,814,543
40 3,814,544
90 3,814,545
298 3,814,546
383 3,814,547
395 3,814,548

P. —	24	3,562	P. —	28	3,563	P. —	48	3,561	P. —	50	3,565	P. —	86	3,564	

CLASSIFICATION OF DESIGNS

D1—	99	231,716	D8—	109	231,723	D12—	31	231,730	D24—	1D	231,737	D34—	5PP	231,744	D54—	2A	231,750
D2—	320	231,717		117	231,724		100	231,731	D25—	R	231,738		SS	231,745	D56—	4B	231,753
D6—	19A	231,720		162	231,725		209	231,732	D26—	Q	231,739			231,746		R	231,751
	114	231,718	D9—	40	231,726	D13—	1D	231,733		13R	231,741	D35—	3A	231,747			231,752
	130	231,719		51	231,727	D16—	A	231,734		14A	231,740	D40—	1E	231,748	D61—	1B	231,754
D7—	141	231,721		157	231,728	D22—	7	231,735			231,742	D48—	20C	231,749	D86—	8	231,755
	191	231,722		216	231,729	D23—	18	231,736	D30—	13	231,743						

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Utah..... 49
Vermont..... 50
Virginia..... 51
Virgin Islands..... 52
Washington..... 53
West Virginia..... 54
Wisconsin..... 55
Wyoming..... 56
U.S. Air Force..... 57
U.S. Army..... 58
U.S. Navy 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,813,788
3,813,949
3,814,022
3,814,093
3,815,048
2 : 3,813,834
4 : 3,813,730
3,813,737
3,813,979
3,814,079
3,814,189
3,814,354
3,814,540
3,814,918
3,815,120
3,815,123
5 : 3,814,118
3,814,282
3,814,543
3,815,125
6 : Re.28,030
3,813,700
3,813,705
3,813,709
3,813,716
3,813,727
3,813,769
3,813,773
3,813,776
3,813,777
3,813,778
3,813,791
3,813,804
3,813,805
3,813,823
3,813,830
3,813,835
3,813,839
3,813,856
3,813,888
3,813,917
3,813,931
3,813,945
3,813,982
3,813,983
3,813,984
3,813,993
3,814,009
3,814,013
3,814,020
3,814,023
3,814,032
3,814,049
3,814,053
3,814,064
3,814,085
3,814,087
3,814,091
3,814,103
3,814,132
3,814,163
3,814,196
3,814,203
3,814,249
3,814,252
3,814,255
3,814,263
3,814,275
3,814,283
3,814,303
3,814,317
3,814,327
3,814,345
3,814,373
3,814,374
3,814,376
3,814,377
3,814,382
3,814,391
3,814,394
3,814,404
3,814,424
3,814,431
3,814,435
3,814,437
3,814,439
3,814,441
3,814,507
3,814,514
3,814,526
3,814,547
3,814,574
3,814,578
3,814,582
3,814,618
3,814,669
3,814,694
3,814,695
3,814,804
3,814,807
3,814,813
3,814,839
3,814,840
3,814,846
3,814,856
3,814,857
3,814,867
8 : 3,813,733
3,813,766
3,813,878
3,813,933
3,813,977
3,814,072
3,814,080
3,814,246
3,814,329
3,814,459
3,814,628
3,814,849
3,814,863
9 : 3,813,702
3,813,726
3,813,779
3,813,780
3,813,827
3,813,916
3,813,934
3,813,965
3,814,156
3,814,173
3,814,294
3,814,351
3,814,558
3,814,610
3,814,644
3,814,659
3,814,666
3,814,667
3,814,691
3,814,742
3,814,760
3,814,766
3,814,784
3,814,898
3,814,938
3,814,986
3,815,036
3,815,079
10 : 3,814,286
3,814,341
3,814,502
3,814,607
3,814,645
3,814,657
3,814,735
3,814,751
3,814,757
11 : 3,814,671
12 : 3,813,750
3,813,756
3,813,783
3,813,795
3,813,833
3,813,905
3,813,913
3,813,986
3,814,136
3,814,150
3,814,352
3,814,473
3,814,522
3,814,575
3,814,584
3,814,655
3,814,661
3,814,733
3,814,836
3,814,837
3,814,864
3,814,994
3,815,001
3,815,023
3,815,031
3,815,144
13 : 3,814,190
3,814,237
3,814,238
3,814,513
3,814,624
16 : 3,813,842
17 : 3,813,706
3,813,782
3,813,810
3,813,812
3,813,846
3,813,903
3,813,904
3,813,906
3,813,914
3,813,925
3,813,962
3,813,970
3,813,972
3,813,975
3,813,985
3,813,989
3,813,992
3,814,026
3,814,029
3,814,109
3,814,137
3,814,144
3,814,148
3,814,151
3,814,191
3,814,212
3,814,236
3,814,257
3,814,260
3,814,262
3,814,267
3,814,269
3,814,272
3,814,284
3,814,300
3,814,328
3,814,343
3,814,346
3,814,367
3,814,379
3,814,381
3,814,384
3,814,411
3,814,438
3,814,462
3,814,465
3,814,466
3,814,530
3,814,534
3,814,544
3,814,626
3,814,782
3,814,816
3,814,822
3,814,858
3,814,859
3,814,862
3,814,866
3,814,896
3,814,981
3,814,989
3,815,004
3,815,008
3,815,117
3,815,119
3,815,126
3,815,146
18 : 3,813,728
3,813,754
3,813,763
3,813,771
3,813,814
3,813,858
3,813,923
3,814,028
3,814,048
3,814,108
3,814,201
3,814,221
3,814,254
3,814,261

3,814,307
3,814,313
3,814,418
3,814,432
3,814,586
3,814,668
3,814,670
3,814,754
3,814,767
3,814,852
3,814,871
3,814,874
3,814,907
3,814,979
3,815,006
3,815,015
3,815,059
3,815,129
19 : 3,813,861
3,813,967
3,814,205
3,814,265
3,814,413
3,814,491
3,814,748
20 : 3,813,816
3,813,994
3,814,331
3,814,518
3,814,911
21 : 3,813,710
3,813,789
3,813,929
3,813,942
3,814,116
3,814,326
3,814,333
3,814,363
3,814,546
3,814,550
3,815,014
3,815,113
22 : 3,813,844
3,814,182
3,814,302
3,814,915
3,814,916
23 : 3,814,878
24 : 3,813,775
3,813,920
3,814,057
3,814,139
3,814,308
3,814,524
3,814,647
3,814,854
3,814,870
3,814,964
3,815,030
3,815,124
3,815,134
25 : 3,813,732
3,813,734
3,813,739
3,813,741
3,813,781
3,813,819
3,813,892
3,813,946
3,814,033
3,814,038
3,814,094
3,814,106
3,814,344
3,814,361
3,814,386
3,814,467
3,814,490
3,814,503
3,814,539
3,814,621
3,814,637
3,814,652
3,814,673
3,814,753
3,814,835
3,814,860
3,814,872
3,814,905
3,814,921
3,814,922
3,814,947
3,815,053
3,815,055
3,815,056
3,815,094
3,815,099
3,815,100
3,815,103
3,815,111
3,815,121
26 : 3,813,708
3,813,723
3,813,746
3,813,755
3,813,770

3,813,829
3,813,877
3,813,891
3,813,893
3,813,940
3,813,944
3,813,971
3,813,976
3,814,071
3,814,074
3,814,078
3,814,222
3,814,225
3,814,226
3,814,245
3,814,247
3,814,250
3,814,251
3,814,270
3,814,314
3,814,337
3,814,371
3,814,392
3,814,442
3,814,444
3,814,448
3,814,449
3,814,461
3,814,474
3,814,482
3,814,488
3,814,489
3,814,519
3,814,528
3,814,555
3,814,594
3,814,630
3,814,674
3,814,688
3,814,721
3,814,796
3,814,861
3,814,876
3,814,935
3,815,108
27 : Re.28,032
3,813,751
3,813,768
3,813,785
3,813,811
3,813,859
3,813,883
3,813,907
3,813,918
3,813,922
3,813,966
3,814,007
3,814,059
3,814,110
3,814,198
3,814,349
3,814,353
3,814,428
3,814,445
3,814,532
3,814,569
3,814,591
3,814,650
3,814,687
3,814,819
3,814,820
3,814,834
3,814,890
3,814,924
3,815,101
3,815,127
3,815,151
28 : 3,814,293
3,814,961
29 : 3,813,696
3,813,743
3,814,031
3,814,044
3,814,075
3,814,348
3,814,350
3,814,390
3,814,409
3,814,425
3,814,447
3,814,551
3,814,634
3,814,769
3,814,806
30 : 3,813,927
31 : 3,814,058
32 : 3,814,185
3,814,194
33 : 3,814,664
34 : 3,813,707
3,813,729
3,813,753
3,813,787
3,813,854
3,813,956
3,813,999

3,814,000
3,814,076
3,814,115
3,814,129
3,814,142
3,814,176
3,814,204
3,814,216
3,814,227
3,814,256
3,814,258
3,814,274
3,814,276
3,814,277
3,814,358
3,814,364
3,814,365
3,814,393
3,814,398
3,814,497
3,814,498
3,814,499
3,814,501
3,814,504
3,814,521
3,814,529
3,814,552
3,814,583
3,814,615
3,814,633
3,814,643
3,814,680
3,814,690
3,814,692
3,814,704
3,814,705
3,814,725
3,814,732
3,814,740
3,814,743
3,814,771
3,814,786
3,814,788
3,814,793
3,814,794
3,814,817
3,814,818
3,814,841
3,814,923
3,814,927
3,814,941
3,814,951
3,814,952
3,814,973
3,814,996
3,815,028
3,815,033
3,815,037
3,815,040
3,815,042
3,815,047
3,815,049
3,815,051
3,815,054
3,815,089
3,815,092
3,815,110
3,815,122
3,815,131
3,815,139
35 : 3,814,355
3,814,595
3,814,940
36 : Re.28,028
Re.28,029
3,813,695
3,813,699
3,813,703
3,813,704
3,813,717
3,813,720
3,813,799
3,813,813
3,813,825
3,813,887
3,813,898
3,813,908
3,813,990
3,813,991
3,814,021
3,814,036
3,814,051
3,814,070
3,814,088
3,814,096
3,814,099
3,814,101
3,814,107
3,814,135
3,814,147
3,814,166
3,814,231
3,814,241
3,814,248
3,814,298
3,814,310

3,814,319
3,814,359
3,814,422
3,814,426
3,814,477
3,814,484
3,814,516
3,814,535
3,814,537
3,814,560
3,814,585
3,814,588
3,814,598
3,814,599
3,814,600
3,814,611
3,814,638
3,814,658
3,814,693
3,814,696
3,814,698
3,814,700
3,814,706
3,814,714
3,814,719
3,814,722
3,814,745
3,814,768
3,814,800
3,814,809
3,814,821
3,814,843
3,814,868
3,814,869
3,814,873
3,814,881
3,814,906
3,814,909
3,814,929
3,814,953
3,814,954
3,814,975
3,814,977
3,814,999
3,815,011
3,815,012
3,815,013
3,815,022
3,815,024
3,815,025
3,815,026
3,815,066
3,815,080
3,815,088
3,815,093
3,815,107
3,815,112
3,815,137
3,815,141
37 : 3,813,715
3,813,808
3,813,900
3,814,016
3,814,146
3,814,235
3,814,421
3,814,478
3,814,562
3,814,577
3,814,676
3,814,715
3,814,730
3,814,893
3,814,894
3,814,899
3,814,934
3,815,027
3,815,070
3,815,105
38 : 3,814,005
39 : 3,813,714
3,813,725
3,813,745
3,813,784
3,813,786
3,813,800
3,813,820
3,813,832
3,813,836
3,813,838
3,813,845
3,813,853
3,813,857
3,813,911
3,813,950
3,813,951
3,813,987
3,814,001
3,814,027
3,814,030
3,814,043
3,814,095
3,814,120
3,814,138
3,814,158
3,814,160

3,814,164
3,814,174
3,814,193
3,814,199
3,814,206
3,814,211
3,814,219
3,814,243
3,814,299
3,814,312
3,814,324
3,814,325
3,814,330
3,814,366
3,814,378
3,814,383
3,814,399
3,814,401
3,814,412
3,814,434
3,814,470
3,814,479
3,814,492
3,814,531
3,814,548
3,814,563
3,814,566
3,814,568
3,814,573
3,814,576
3,814,662
3,814,689
3,814,729
3,814,770
3,814,777
3,814,780
3,814,808
3,814,823
3,814,824
3,814,826
3,814,844
3,814,900
3,814,926
3,814,971
3,815,041
3,815,071
3,815,072
40 : 3,813,855
3,813,963
3,814,008
3,814,187
3,814,480
3,814,567
41 : 3,813,980
42 : Re.28,027
Re.28,035
Re.28,036
3,813,721
3,813,749
3,813,797
3,813,802
3,813,828
3,813,895
3,813,915
3,813,935
3,813,939
3,813,943
3,813,953
3,813,969
3,813,981
3,814,024
3,814,034
3,814,035
3,814,077
3,814,086
3,814,111
3,814,117
3,814,125
3,814,157
3,814,165
3,814,183
3,814,192
3,814,214
3,814,239
3,814,266
3,814,281
3,814,305
3,814,316
3,814,321
3,814,322
3,814,339
3,814,356
3,814,397
3,814,407
3,814,415
3,814,430
3,814,433
3,814,483
3,814,509
3,814,525
3,814,542
3,814,549
3,814,580
3,814,592
3,814,593
3,814,597

3,814,604
3,814,613
3,814,620
3,814,623
3,814,636
3,814,675
3,814,678
3,814,681
3,814,682
3,814,683
3,814,684
3,814,712
3,814,747
3,814,749
3,814,759
3,814,761
3,814,762
3,814,764
3,814,773
3,814,803
3,814,830
3,814,832
3,814,845
3,814,879
3,814,880
3,814,882
3,814,883
3,814,884
3,814,885
3,814,887
3,814,901
3,814,914
3,814,968
3,815,002
3,815,058
3,815,063
3,815,064
3,815,128
44 : 3,813,694
3,813,698
3,813,757
3,814,380
45 : 3,814,242
3,814,347
3,814,536
46 : 3,814,060
47 : 3,813,801
3,814,143
3,814,220
3,814,304
3,814,311
3,814,587
3,814,728
3,814,828
48 : Re.28,033
3,813,701
3,813,744
3,813,926
3,813,928
3,813,932
3,813,936
3,813,968
3,814,014
3,814,025
3,814,083
3,814,084
3,814,098
3,814,114
3,814,123
3,814,149
3,814,159
3,814,179
3,814,180
3,814,181
3,814,186
3,814,210
3,814,285
3,814,414
3,814,420
3,814,436
3,814,641
3,814,737
3,814,779
3,814,789
3,814,838
3,814,902
3,814,950
3,815,032
3,815,062
3,815,095
3,815,102
3,815,116
3,815,135
49 : 3,813,937
3,814,336
3,814,396
3,815,084
3,815,091
50 : Re.28,034
3,814,992
51 : 3,813,772
3,813,831
3,813,864
3,813,875
3,814,019
3,814,089

3,814,362	3,814,942	3,814,278	55 : 3,813,735	3,814,188	3,814,665
3,814,423	3,814,993	3,814,416	3,813,822	3,814,200	3,814,886
3,814,429	53 : 3,813,837	3,814,419	3,813,843	3,814,240	3,814,888
3,814,559	3,814,003	3,814,685	3,813,880	3,814,288	3,814,948
3,814,590	3,814,041	3,814,774	3,813,885	3,814,291	3,814,987
3,814,601	3,814,090	3,814,825	3,813,896	3,814,295	3,814,998
3,814,627	3,814,102	3,815,038	3,813,954	3,814,487	3,815,035
3,814,653	3,814,105	3,815,140	3,813,998	3,814,493	3,815,060
3,814,814	3,814,130	54 : 3,814,635	3,814,047	3,814,533	3,815,075
3,814,842	3,814,154	3,814,701	3,814,100	3,814,554	3,815,082

DESIGN PATENTS

4 : 231,722	9 : 231,738	231,754	31 : 231,736	38 : 231,716	231,728
6 : 231,733	231,745	18 : 231,724	34 : 231,742	39 : 231,719	231,741
231,735	12 : 231,734	231,730	231,750	231,723	42 : 231,721
231,739	231,737	19 : 231,717	36 : 231,743	231,726	49 : 231,747
231,740	15 : 231,718	25 : 231,749	231,755	231,727	55 : 231,746
231,744	17 : 231,729	26 : 231,731			

PLANT PATENTS

6 : 3,561	3,562	3,563	3,565		

U. S. GOVERNMENT PRINTING OFFICE : O - 1974

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT OFFICE
C. Marshall Dann, *Commissioner*